NEW HAVEN
ELECTRIC LOCOMOTIVES & MU CARS

ROBERT A. LILJESTRAND & DAVID R. SWEETLAND

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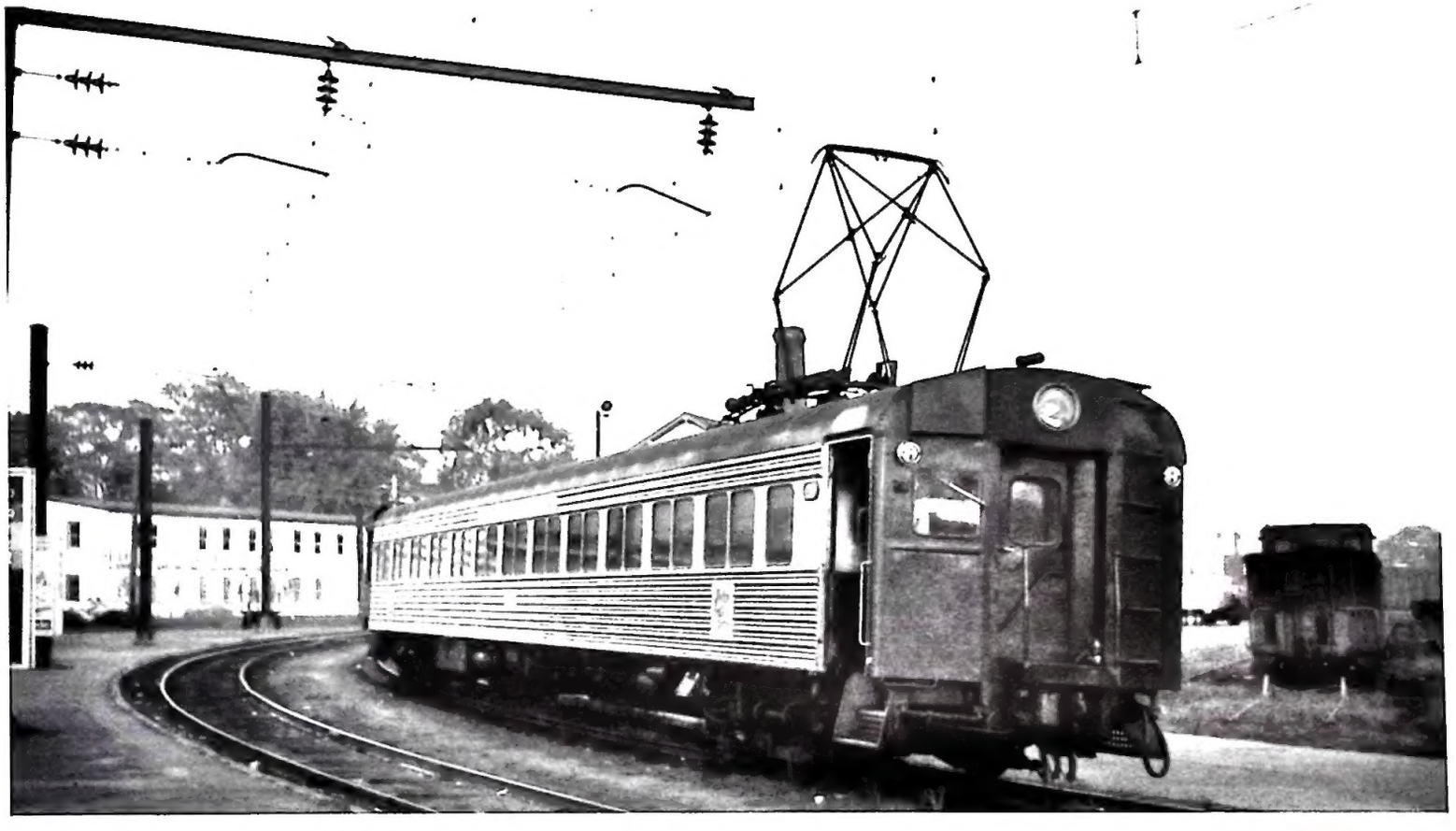

By

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&

DAVID R. SWEETLAND

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DEDICATION

This book is dedicated to men and women of Van Nest Shops who rebuilt and maintained New Haven's electric locomotives and Multiple Unit car fleet until the late 1950s.

ACKNOWLEDGEMENTS

This book is based on the collection of black and white prints and negatives owned by Robert A. Liljestrand. Copies of most of the photographs can be obtained through Bob's Photo, 37 Spring Street, Ansonia, CT 06401. Text and captions were written by David R. Sweetland. This book does not cover all New Haven electric locomotives and MU cars, but is a sampling of most types. Text and captions were word processed by Carol Owens. Images credited in this book to M. D. McCarter may be ordered from M. D. McCarter, P.O. Box 1569, Camp, Verde, AZ 86322-1569.

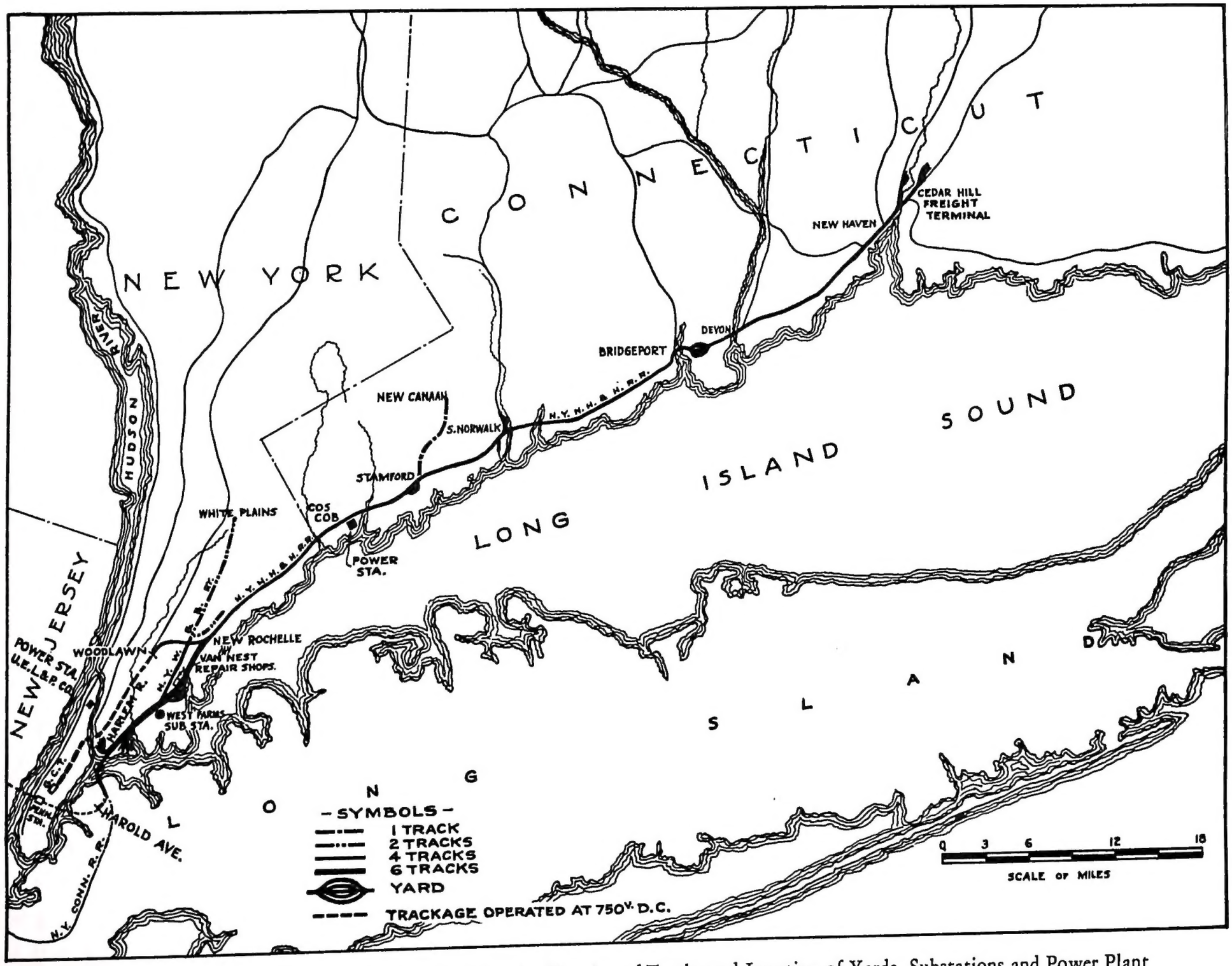
TOP FRONT COVER PHOTO: EF-3 #158 departed New Haven Motor Storage for a run on September 11, 1957. (David R. Sweetland)

BOTTOM FRONT COVER PHOTO: EP-5 #373 with the SENATOR passed westbound through Stamford, CT on April 5, 1956. (David R. Sweetland)

TOP REAR COVER PHOTO: Seven 4400 series MU cars approached New Rochelle, NY on April 5, 1956 bound for New York City. (David R. Sweetland)

BOTTOM REAR COVER PHOTO: Several round roof MU cars departed Stamford station on April 5, 1956, with the first car painted in the McGinnis era color scheme. (David R. Sweetland)

TITLE PAGE PHOTO: New Haven MU car #4430 was on the curve in front of the Danbury, CT station on September 25, 1957. (Norton Clark collection)



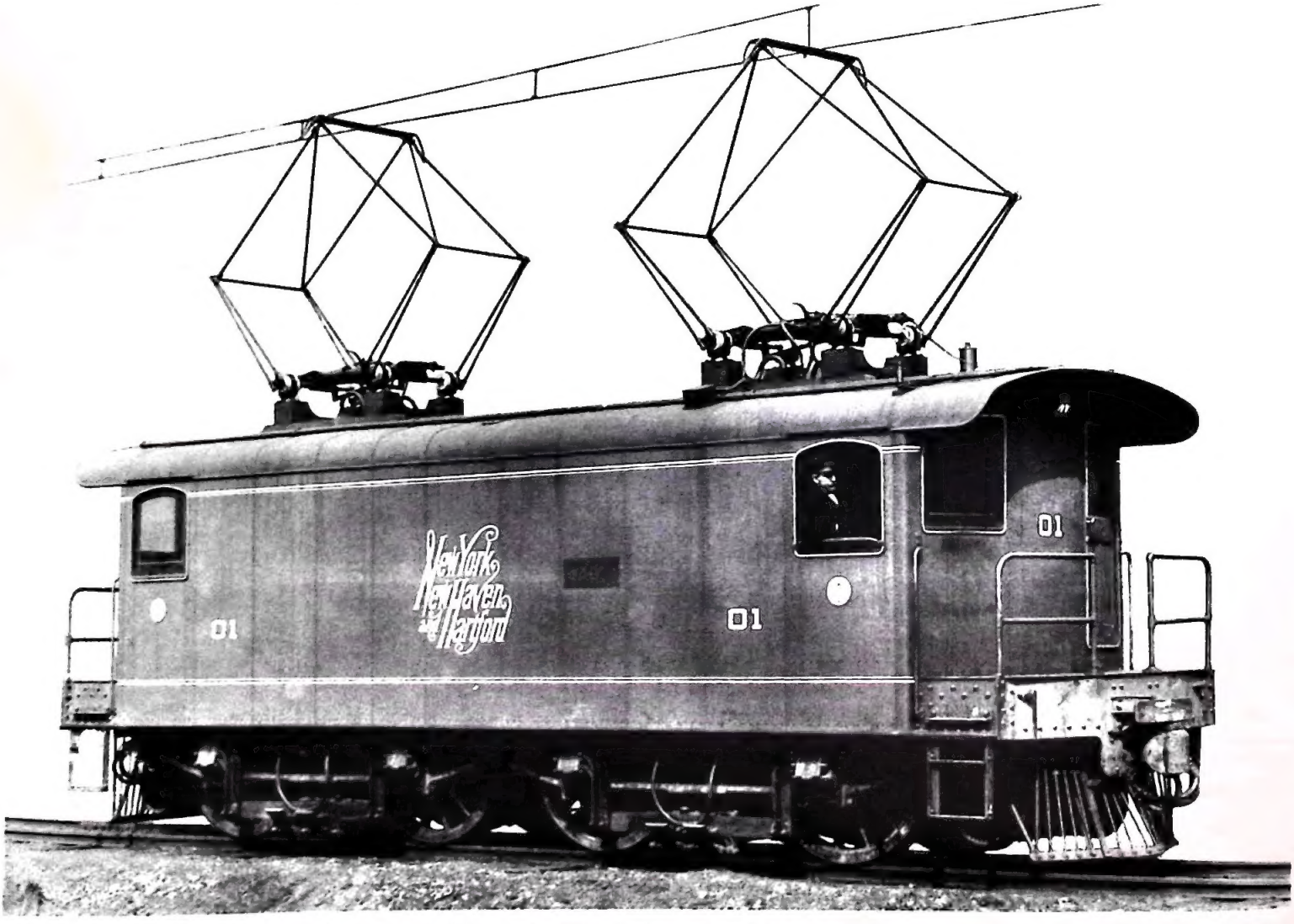
Map of New Haven Electrification Showing Number of Tracks and Location of Yards, Substations and Power Plant

CLASS EP-1

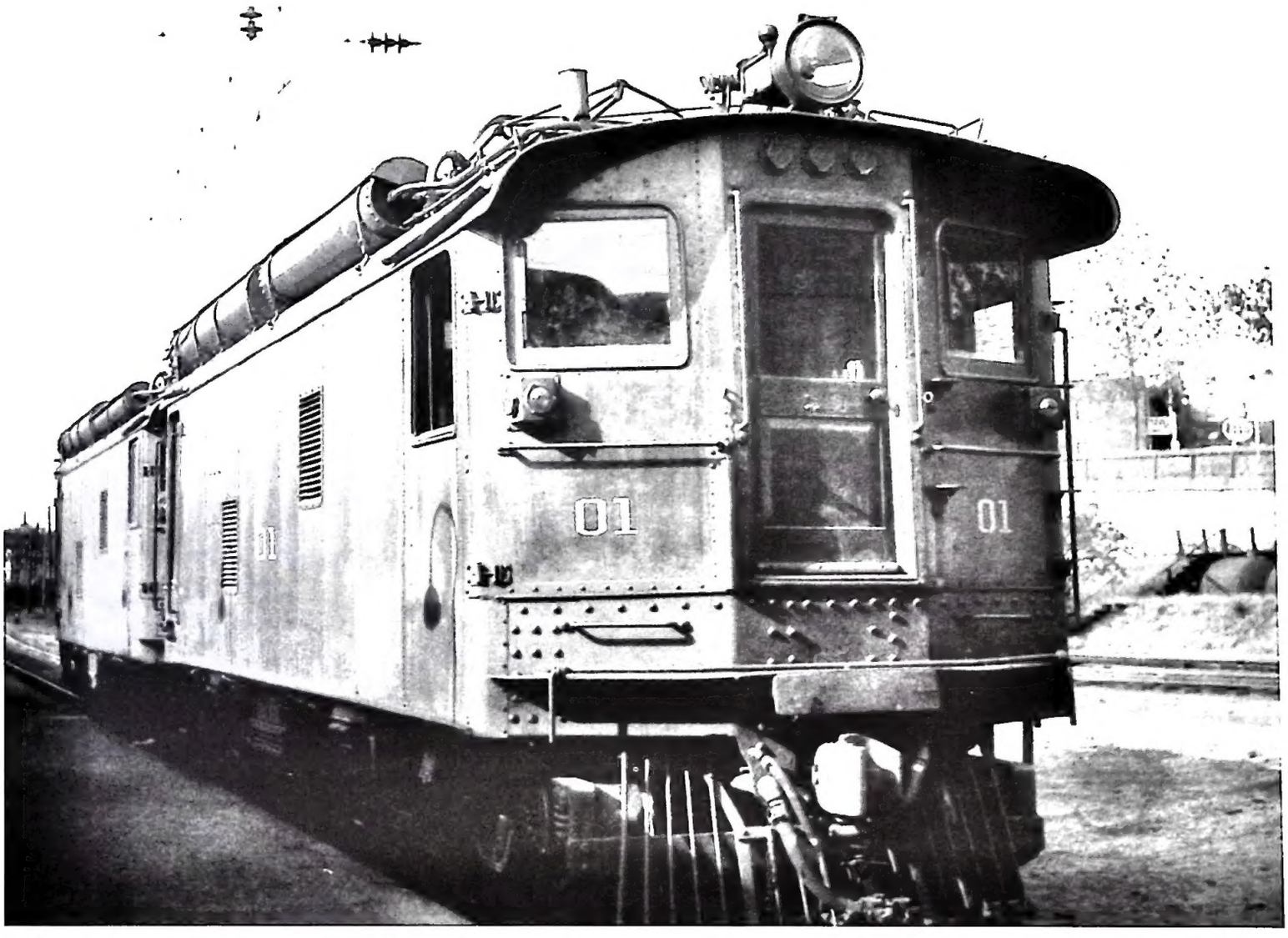
EP-1	**01**	**BW**	**1905**
EP-1	**02-035**	**BW**	**1906-1907**
EP-1	**036-041**	**BW**	**1908**

For service into Grand Central Station, later Grand Central Terminal, the New Haven Railroad ordered thirty-five electric locomotives in 1905. These locomotives had to be able to operate on the new 11,000 volt 25 cycle catenary system being installed on the New Haven from Woodlawn, NY to Stamford, CT plus the New York Central's (then New York Central & Hudson River) third rail DC 600 volt system. The first locomotive, #01, was built in December 1905 with end platforms and a shorter carbody. Unit #02, built shortly after the arrival of #01, had a full length carbody and became the standard for the remainder of the run. Because of this, #02 became #01 and #02 changed to number 01. Following 2nd #01, #03 to 035 were built between June 1906 and February 1907. Tracking qualities of the units turned out very poor at speed, so the wheel arrangement was converted to a 1-B+B-1 arrangement with all unit modifications completed by 1909. These units, later called "Pony" because of their new wheel arrangement, exceeded the specifications for pulling capacity. A second group, #036-041, was built in 1908. During the first 20 years of service, the EP-1 units averaged 1,250,000 miles each.

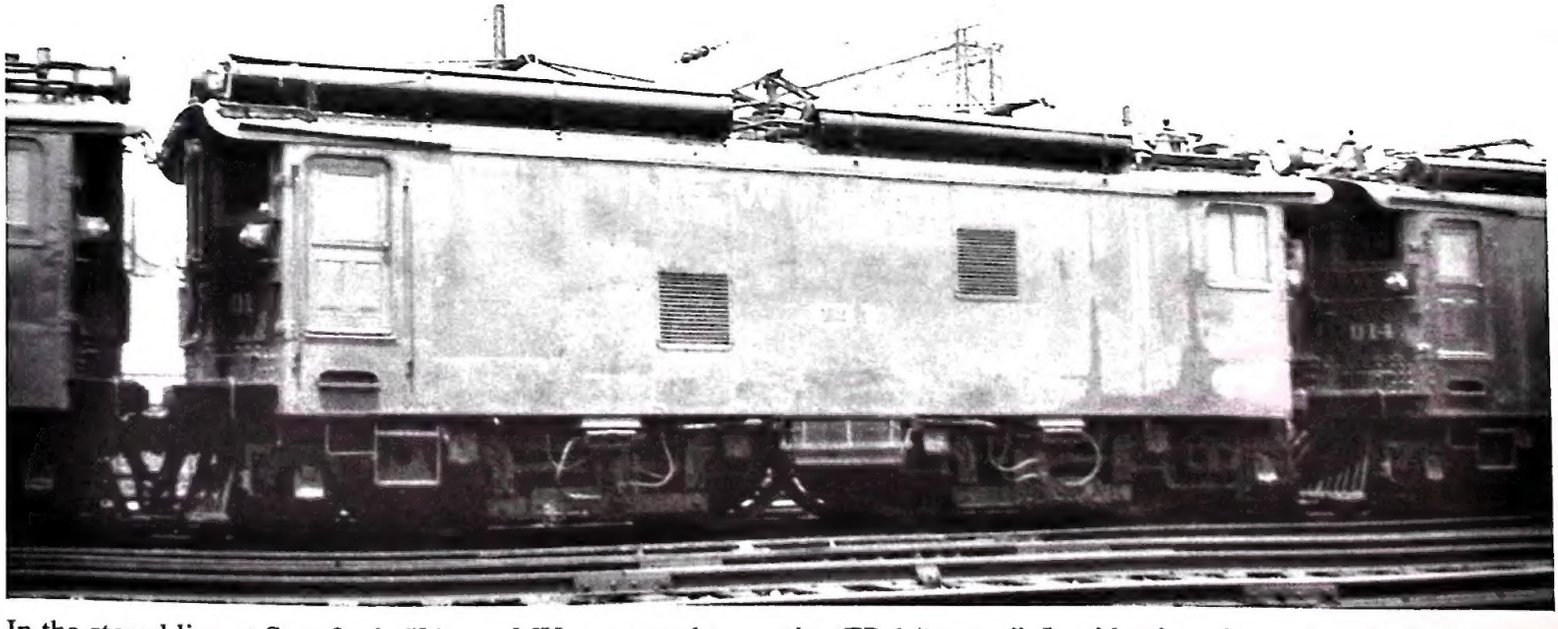
After the arrival of the EP-4 locomotives and at the end of the Great Depression, twenty-five were condemned in 1936 and two in 1938. Four of these "motors," #01, 025, 030 and 039, lasted on the New Canaan Branch until 1947.



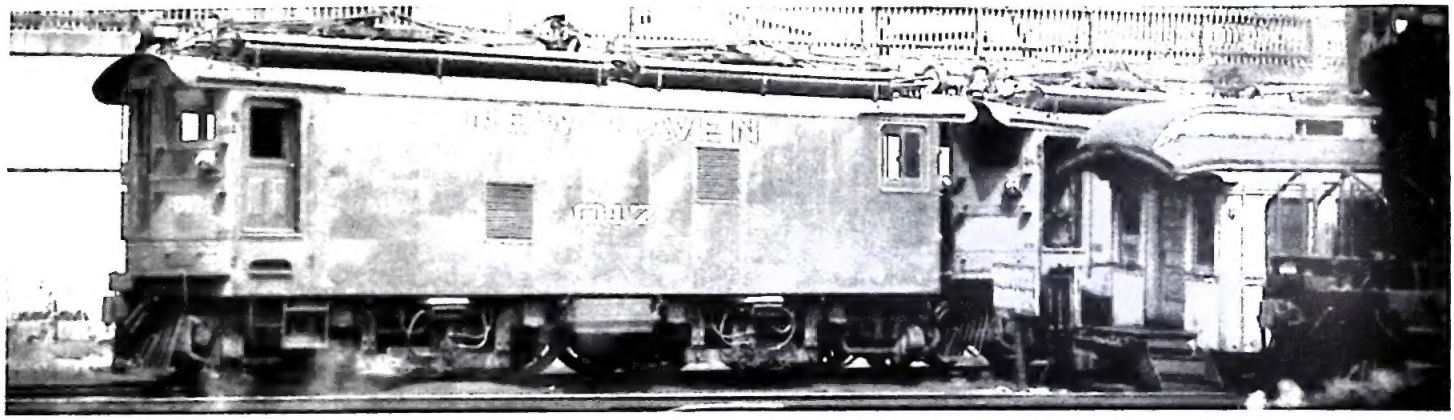
A Baldwin builders photograph showing #01 as originally built with a B-B wheel arrangement, main reservoirs behind the pilots, front platform on each end and headlight mounted under the roof between the engineers front window and cab door. Baldwin-Westinghouse built the original #01 in December, 1905. (Norton Clark collection)



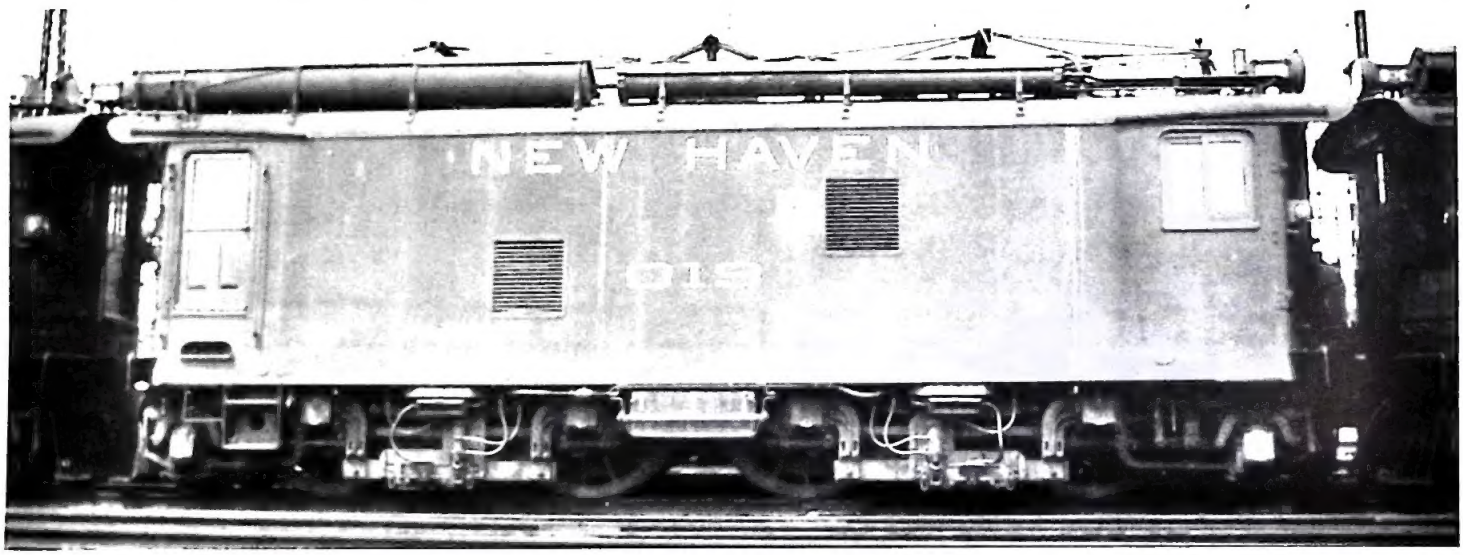
A front view of #01 (former #02) with main reservoirs on the roof (note protective hoods), roof mounted headlight and extended cab. EP-1 #01 MUed with one other was at New Haven station in August 1938. (M. D. McCarter)



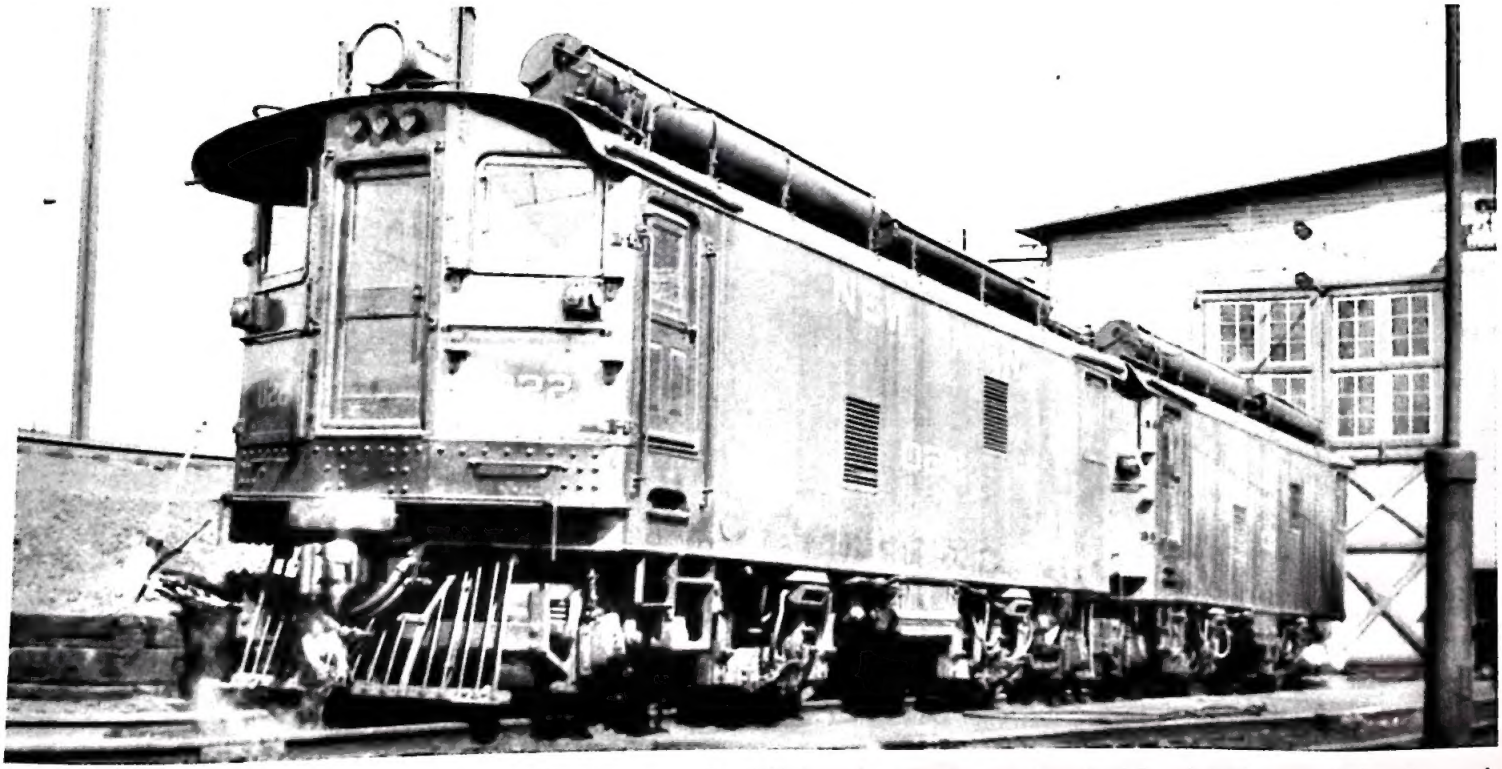
In the stored line at Stamford, #01 was MU connected to another EP-1 "motor." Its side view shows the rebuilt 1-B+B-1 wheel arrangement. This locomotive returned to service after the Great Depression and continued in service until condemned in June 1947. (Norton Clark collection)



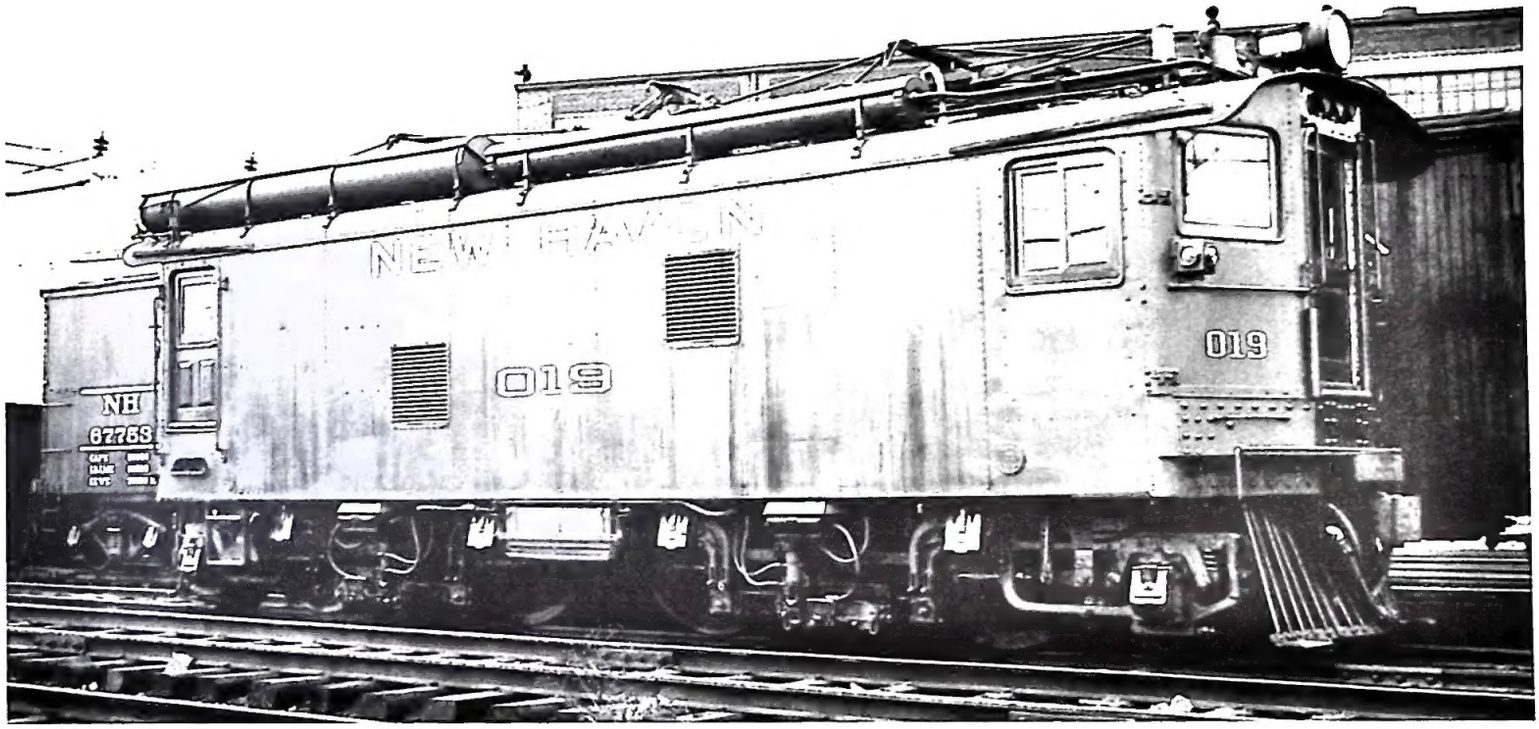
MUed with the #036, EP-1 #017 was at New Haven Motor storage in August 1937. Baldwin-Westinghouse built this "motor" in October 1906 for the New Haven, and it continued in operation until condemned in February 1944. (M. D. McCarter)



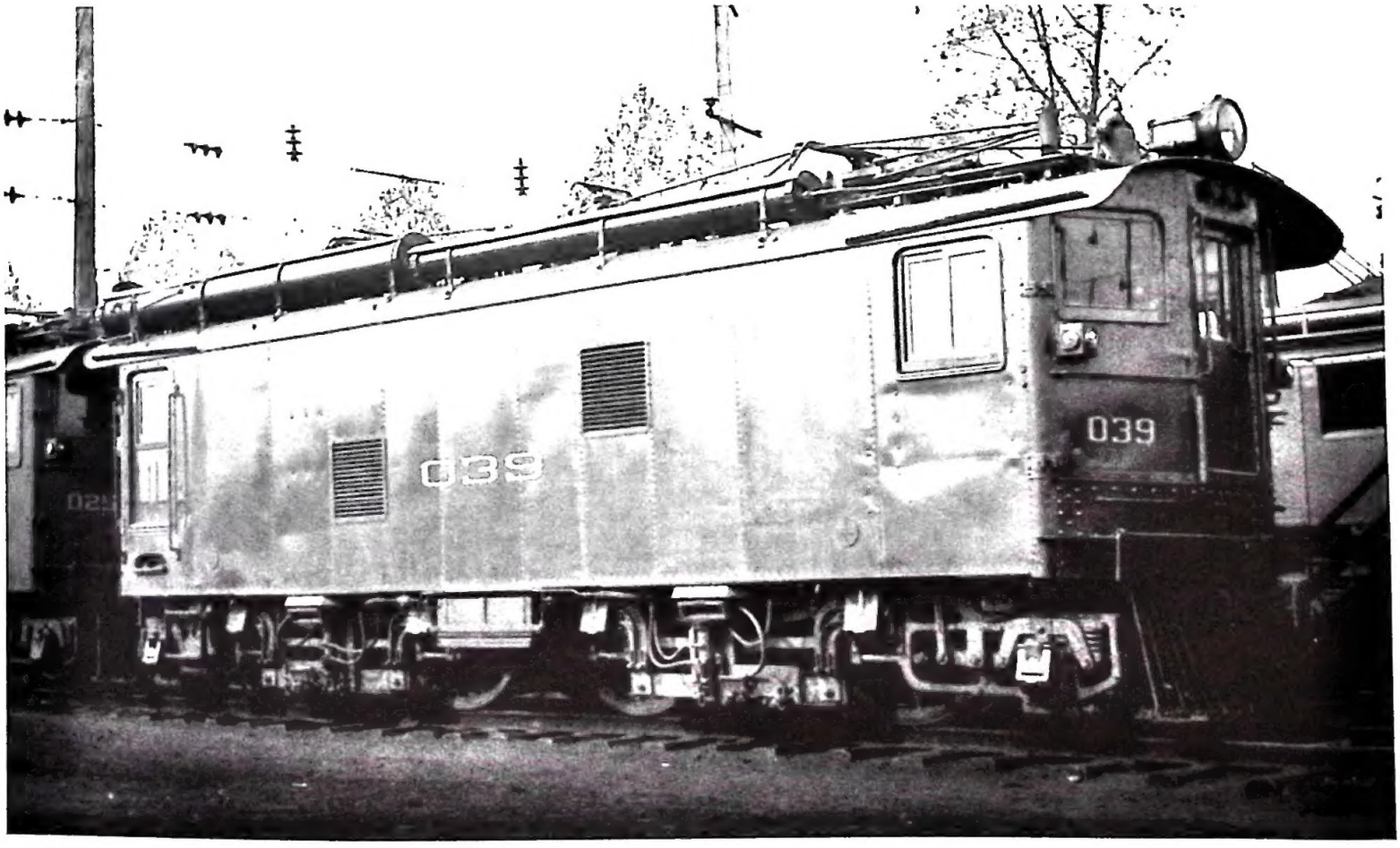
A side view of #019 at Stamford in August 1934 showed the two third rail shoe beams on the right side of the "motor." Four years later in November 1938, the locomotive was condemned and later scrapped. (Norton Clark collection)



Positioned in front of the shop at Stamford, #022 plus one other EP-1 waited for inspection in March 1936. Built in November 1906, this "motor" was not condemned until February 1940. (Norton Clark collection)



EP-1 "motor" #019 was at Van Nest shops in the mid 1930s. Built by Baldwin-Westinghouse in October 1906, #019 continued in service for the New Haven until condemned in November 1938. This photograph shows the rear side and end view of the unit.



Coupled and MUed with #025, EP-1 #039 stopped at New Haven Motor Storage on October 11, 1936. Built in March 1908 by Baldwin-Westinghouse, #039 was one of the last EP-1 "motors" to operate, not condemned until June 1947. (Norton Clark collection)

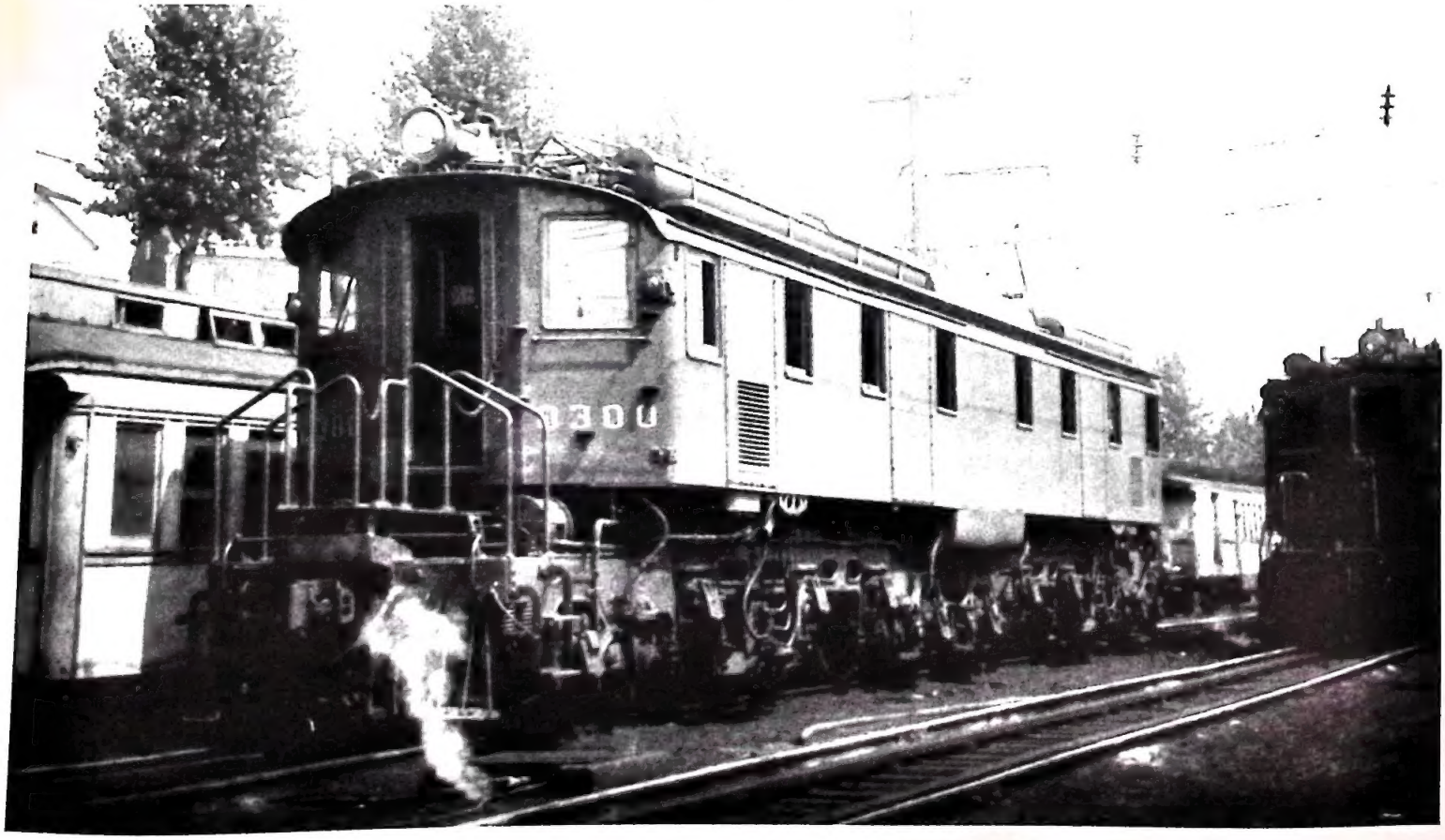
CLASS EP-2

EP-2	**0300-0304**	**BW**	**1918-1919**
EP-2	**0305-0316**	**BW**	**1923**
EP-2	**0317-0326**	**BW**	**1926-1927**

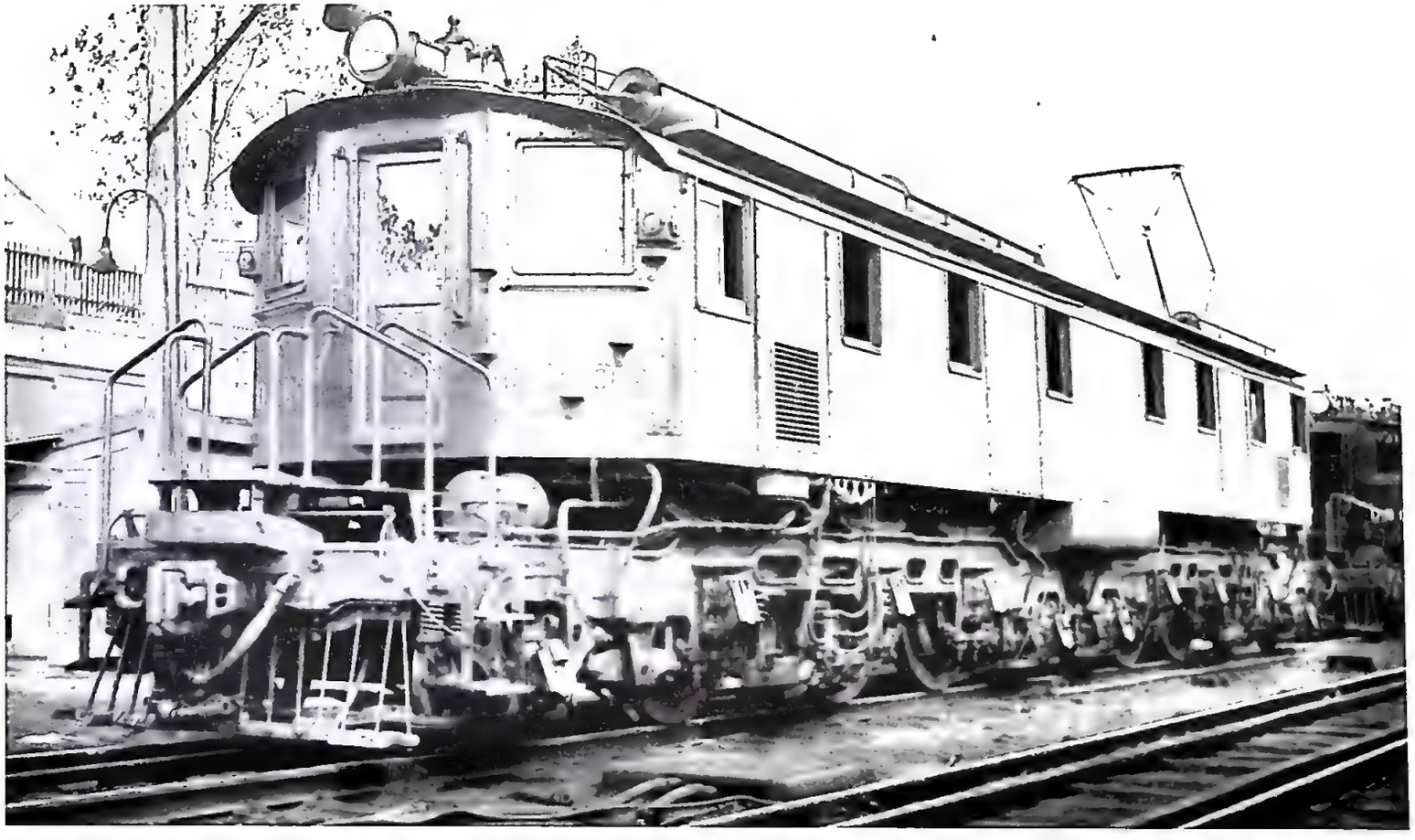
After the operation of forty-one small passenger locomotives during the first decade of the 20th century, the New Haven ordered a much larger passenger "motor" with a new 1-C+C-1 wheel arrangement. Built by Baldwin-Westinghouse between October 1918 and April 1919, five new 350,000 pound locomotives were delivered to the New Haven equipped to operate on either 11,000-volt AC or 600-volt DC. Numbered 0300-0304, the "motors" had a one hour rating of 2,460hp and a starting tractive effort at 20.4% of 47,520 pounds. Overall length of the motor was 69 feet between coupler pulling faces and geared for a maximum speed of 70 MPH. The class of EP-2 was not applied to these units until the early 1940s.

Following successful service, a second group, #0305-0316, was ordered for delivery in 1923 and 1924. Total weight of each unit increased to 356,000 pounds and with improved motor ratings, the total capacity of the "motors" averaged 80,000 miles per year with monthly mileage as high as 11,000 miles per locomotive. Between September and November 1926, five more class EP-2 units, #0317-0321, were delivered, and #0322-0326 the following year.

"Motors" #0315-0308 received cab signals for Penn Station service when the PRR AC electrification was installed in 1933. To operate in multiple for possible freight service, #0305-0314 received MU equipment in 1930; however, they spent most of their time in passenger service. During the Pat McGinnis era, #312 and 322 received the red/white and black color scheme at Van Nest shops. As the new EP-5 "motors" were delivered in 1955, the original five, #0300-0304, went to scrap. The remainder of the class were condemned between 1957 and 1959.



Number 0300 was the first "motor" in New Haven's fleet of EP-2 passenger electric locomotives. Built by Baldwin-Westinghouse in October 1918, #0300 was photographed at New Haven Motor Storage in August 1937. This "motor" was sold for scrap in June 1956. (M. D. McCarter)



Spotted at New Haven Motor Storage on October 11, 1936, EP-2 #0302 waited for its next westbound assignment. One of the original five, #0300-0304, #0302 was built by Baldwin-Westinghouse in January 1919. The idler wheels were of 36-inch diameter, and the main drivers had 63-inch wheels, all mounted on plain bearing axles. (Norton Clark collection)

In 1950 the New Haven eliminated the leading zero in the number, so EP-2 "motor" #0314 became #314. Motor #0314 was the last of ten EP-2 motors, #0305-0314, to be equipped with MU receptacles to operate in multiples. Photographed at Oak Point on May 19, 1957, #314 displayed its MU equipment over the front cab door. (Norton Clark collection)

CLASS EP-2

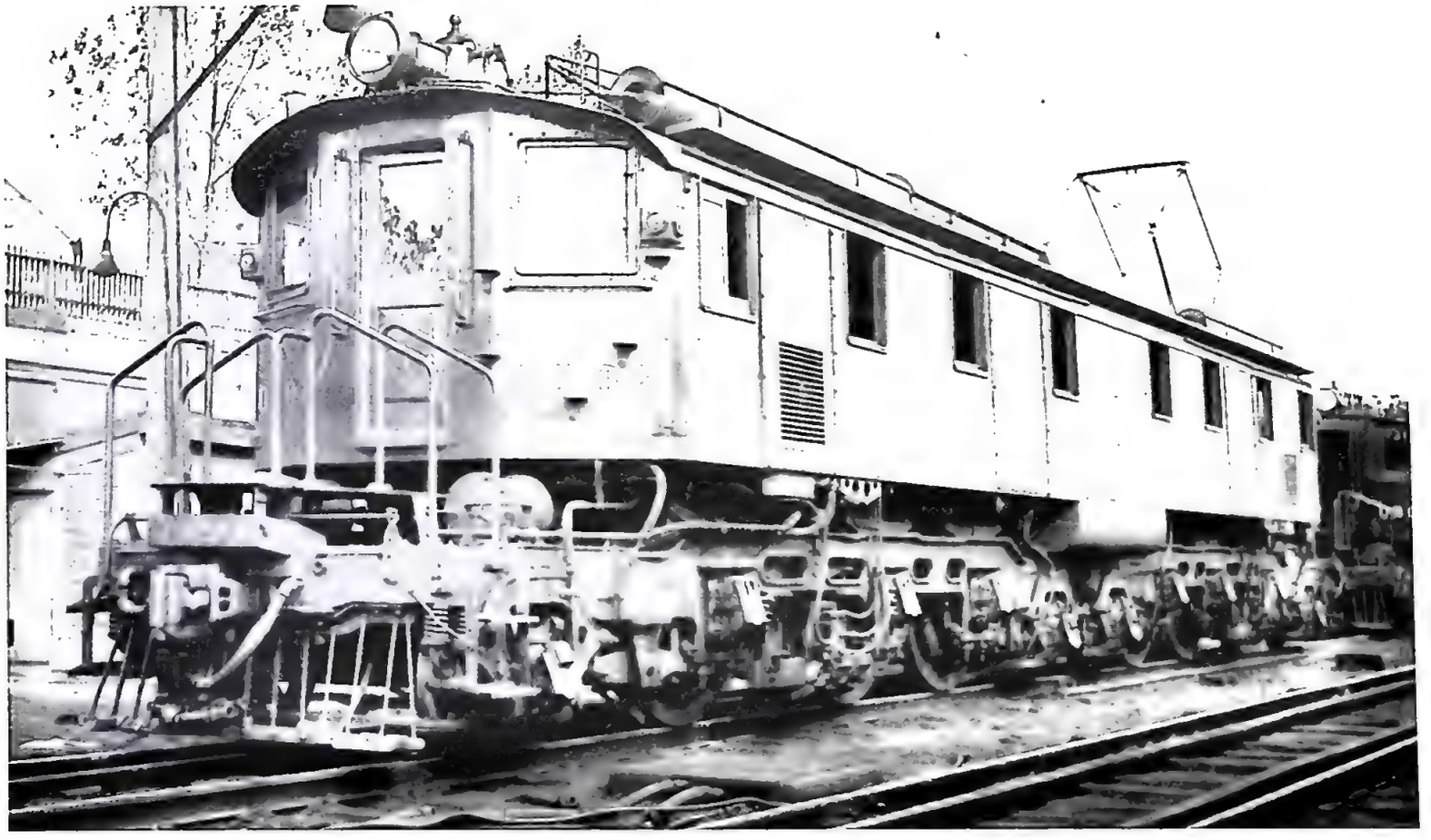
EP-2	**0300-0304**	**BW**	**1918-1919**
EP-2	**0305-0316**	**BW**	**1923**
EP-2	**0317-0326**	**BW**	**1926-1927**

After the operation of forty-one small passenger locomotives during the first decade of the 20th century, the New Haven ordered a much larger passenger "motor" with a new 1-C+C-1 wheel arrangement. Built by Baldwin-Westinghouse between October 1918 and April 1919, five new 350,000 pound locomotives were delivered to the New Haven equipped to operate on either 11,000-volt AC or 600-volt DC. Numbered 0300-0304, the "motors" had a one hour rating of 2,460hp and a starting tractive effort at 20.4% of 47,520 pounds. Overall length of the motor was 69 feet between coupler pulling faces and geared for a maximum speed of 70 MPH. The class of EP-2 was not applied to these units until the early 1940s.

Following successful service, a second group, #0305-0316, was ordered for delivery in 1923 and 1924. Total weight of each unit increased to 356,000 pounds and with improved motor ratings, the total capacity of the "motors" averaged 80,000 miles per year with monthly mileage as high as 11,000 miles per locomotive. Between September and November 1926, five more class EP-2 units, #0317-0321, were delivered, and #0322-0326 the following year.

"Motors" #0315-0308 received cab signals for Penn Station service when the PRR AC electrification was installed in 1933. To operate in multiple for possible freight service, #0305-0314 received MU equipment in 1930; however, they spent most of their time in passenger service. During the Pat McGinnis era, #312 and 322 received the red/white and black color scheme at Van Nest shops. As the new EP-5 "motors" were delivered in 1955, the original five, #0300-0304, went to scrap. The remainder of the class were condemned between 1957 and 1959.

Number 0300 was the first "motor" in New Haven's fleet of EP-2 passenger electric locomotives. Built by Baldwin-Westinghouse in October 1918, #0300 was photographed at New Haven Motor Storage in August 1937. This "motor" was sold for scrap in June 1956. (M. D. McCarter)



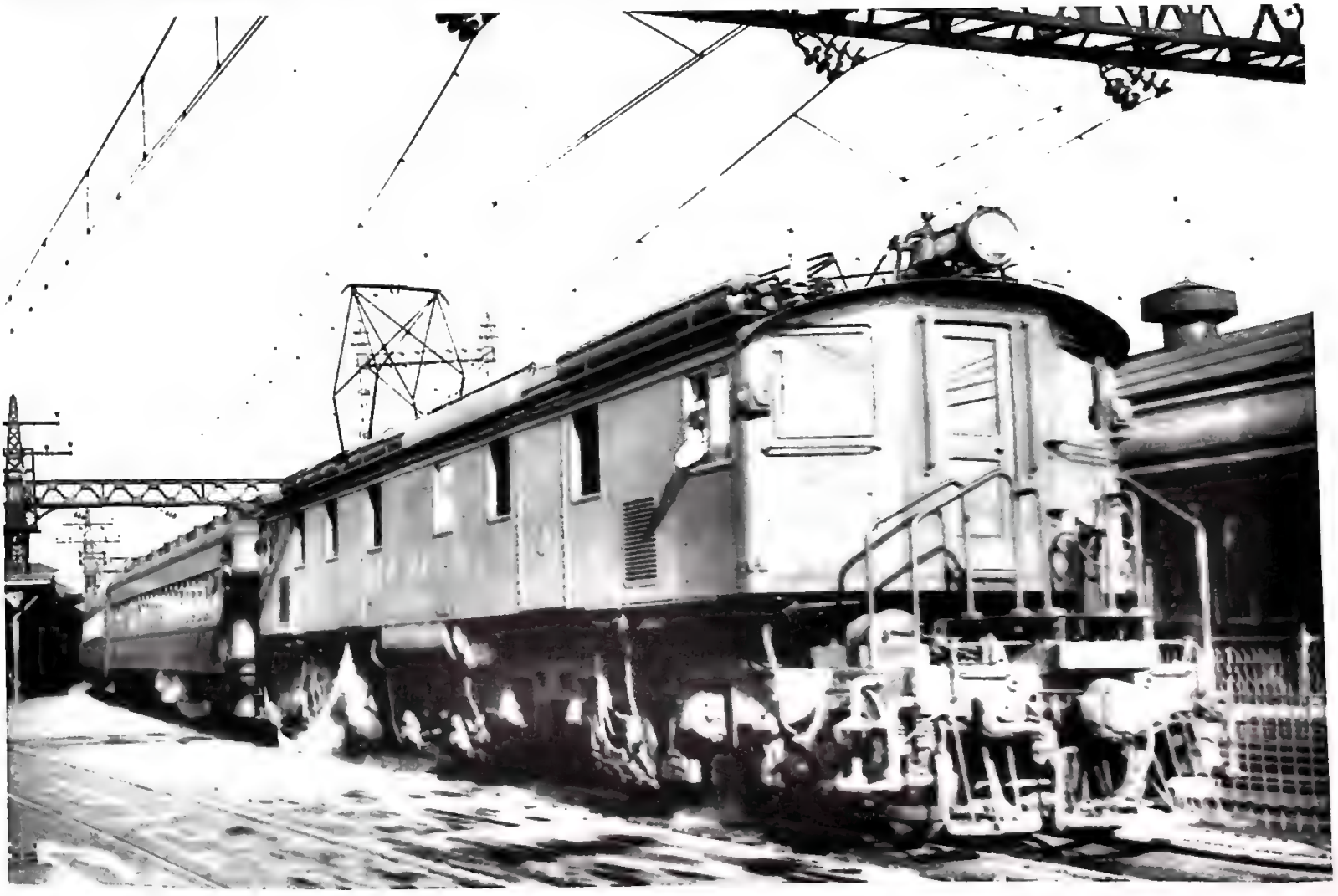
Spotted at New Haven Motor Storage on October 11, 1936, EP-2 #0302 waited for its next westbound assignment. One of the original five, #0300-0304, #0302 was built by Baldwin-Westinghouse in January 1919. The idler wheels were of 36-inch diameter, and the main drivers had 63-inch wheels, all mounted on plain bearing axles. (Norton Clark collection)

In 1950 the New Haven eliminated the leading zero in the number, so EP-2 "motor" #0314 became #314. Motor #0314 was the last of ten EP-2 motors, #0305-0314, to be equipped with MU receptacles to operate in multiples. Photographed at Oak Point on May 19, 1957, #314 displayed its MU equipment over the front cab door. (Norton Clark collection)

Between the poles at Motor Storage, EP-2 #0319 waited for its run to Grand Central Terminal. Between the number 1 and 2 main drives were mounted the retractable third rail shoes. Looking at the roof line, the train heating boiler stack stood at the center of the unit, just ahead of the third rail pantograph. (M. D. McCarter)

Under the catenary at Bridgeport station, EP-2 #0320 had cut away from its train in July 1937. The rear roof line displayed the whistle, bell and steam locomotive style headlight. Under the electric marker light, a flag had been placed in the holder. (M. D. McCarter)

One of two EP-2 "motors" repainted in the McGinnis era color scheme, #322 was at New Haven on May 19, 1957, coupled to an EP-5. Looking at the front end, the cab door was painted black with a white N over H logo in the lower panel. Built in August 1927, #0322 was not condemned until April 1959, one of the last two EP-2 units to operate on the New Haven. (Norton Clark collection)



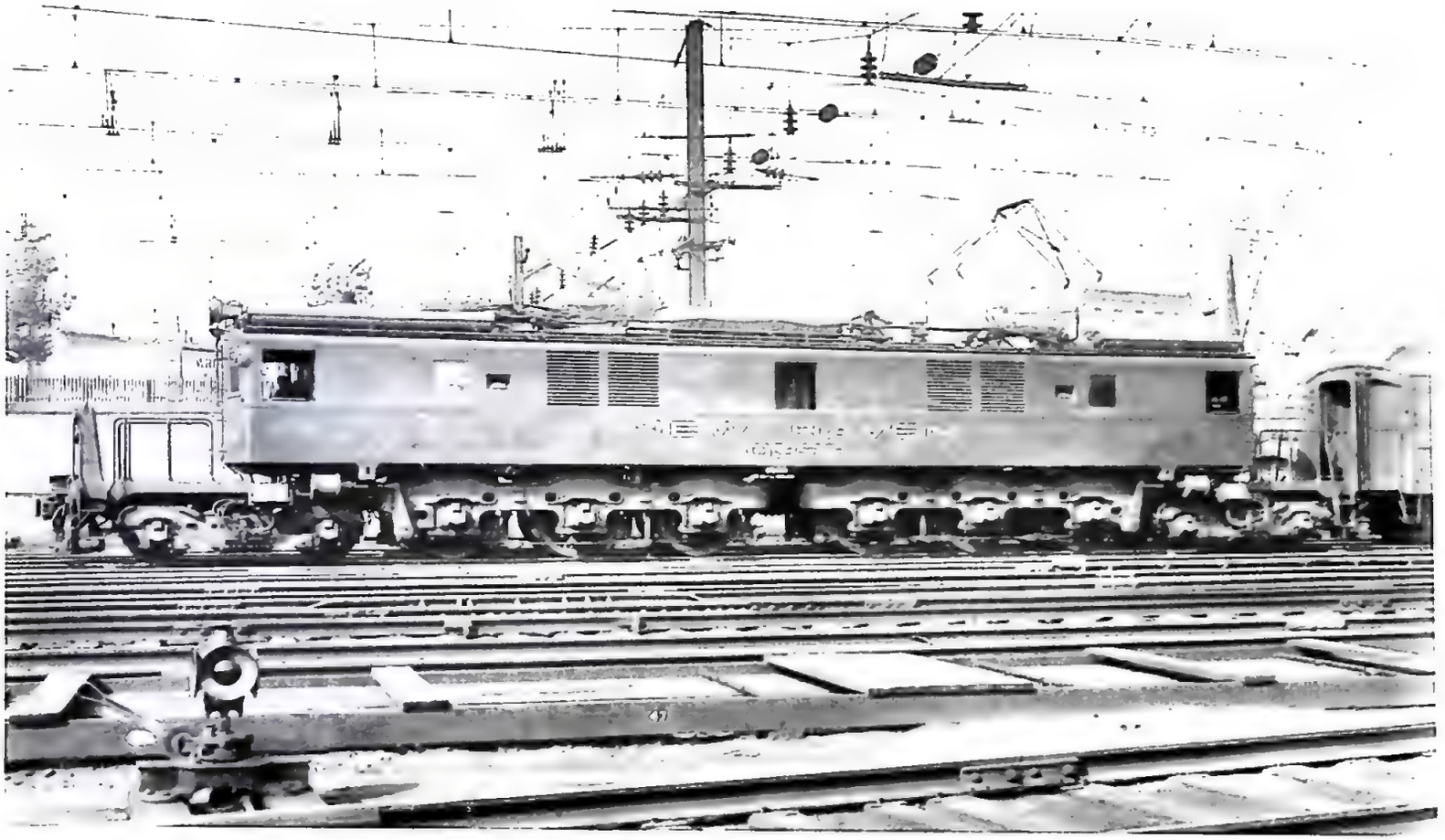
One of the last EP-2 units built, #0323 came as part of the newest group, #0322-0326, in August 1927. Waiting for the conductor's signal, #0323 was about to depart westbound from Bridgeport station in February 1940. The steam exhaust indicated that the train heating boiler was in service. (M. D. McCarter)

CLASS EP-3

EP-3	**0351-0360**	**GE**	**1931**

After years of locomotive purchases from Westinghouse for the electric zone, the New Haven switched to General Electric in 1931 for a ten unit passenger locomotive order. In 1929, General Electric had designed DC "Motors" for the Cleveland Union Terminal's 3000-volt DC catenary system. These DC electric locomotives had a new 2-C+C-2 wheel arrangement which GE modified to an AC locomotive version for the New Haven. Numbered #0351-0360, these new GE box cab "motors" weighed 402,000 pounds each and measured 14-foot 6-inches high over locked down pantograph. The length over couplers was 77 feet equipped with 56-inch main drivers geared for 70 MPH operation, later changed to a 79:22 gear ratio for an 80 MPH top speed. The units were designed to pull fifteen 80-ton Pullman cars at track speed in AC territory. During the life of these EP-3 motors, the only major change occurred during the 1940s when the main transformers were changed from air cooled to pyramid cooled type like the PRR GG1 electric locomotives. Number 0360 was renumbered to #0350 in 1946 and the prefix 0 dropped for the group in 1950. The entire class was condemned between 1959 and 1963 when the carrier preferred to operate diesel locomotives "under the wire."

At Motor Storage in the late 1940s, EP-3 #0353 waited on the pit in "Blue Signal" protected territory. Starting in 1945, some of the EP-3 units like #0353 received the pin stripe on Hunter green color scheme. Not only did the unit have stripes on the bottom carbody panels, but also either side of the unit number in the center upper panels. The shoe beams were located at all



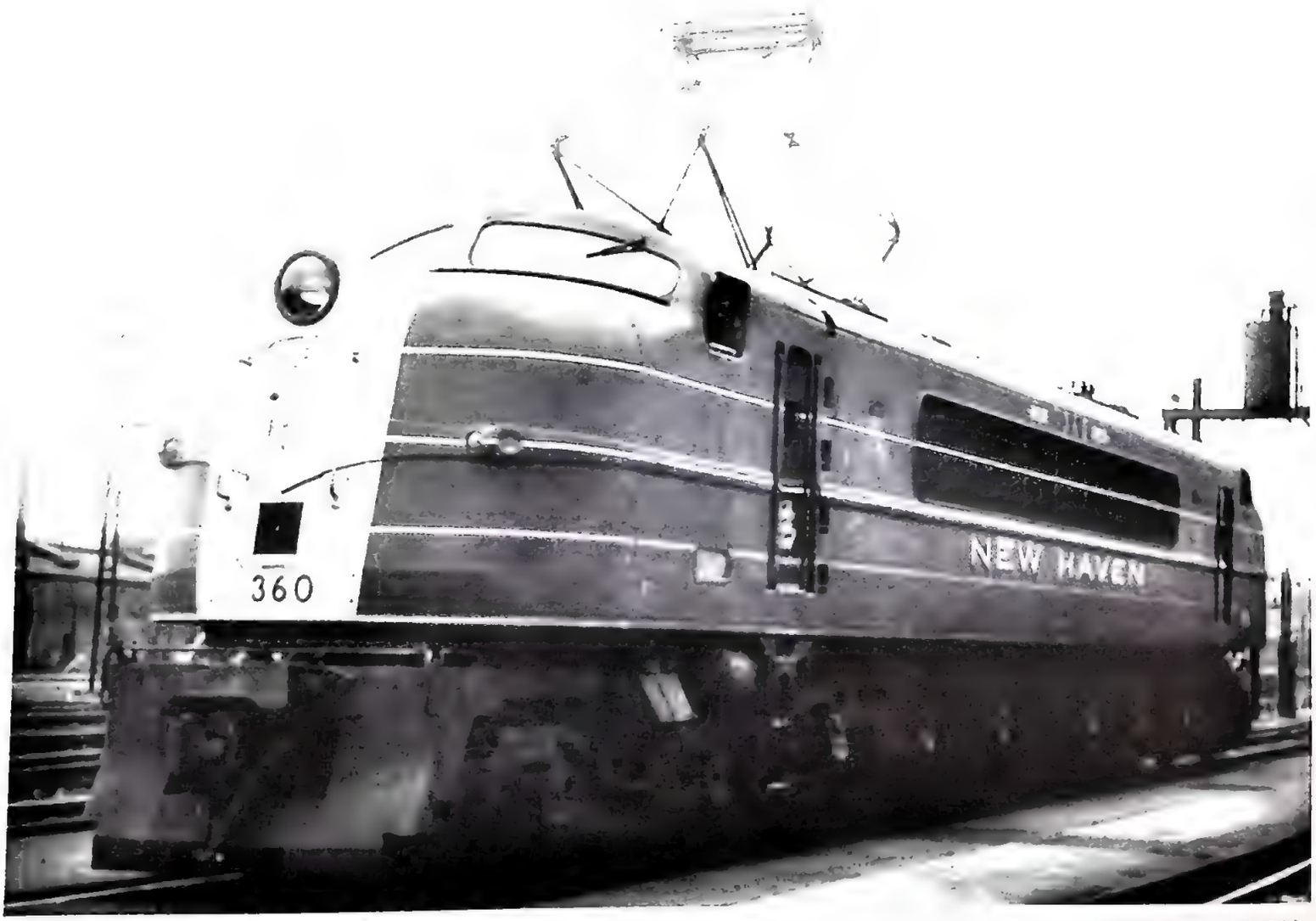
Shortly after delivery, EP-3 #0353 coupled to its train at New Haven. This 2-C+C-2 motor had its steam heating boiler mounted at the rear end, main reservoirs on the roof at both ends and the small third rail pantograph located near the center of the unit on the roof.

New Haven's "flat bottom" #0357 was ready at New Haven for a run to Grand Central Terminal or Penn Station. All ten of these "motors" had cab signal equipment for operation into PRR's Penn Station. These EP-3 electric locomotives were the forerunner for the wheel arrangement on the famous GG1 electric locomotive built for the PRR starting in 1934. (Norton Clark collection)

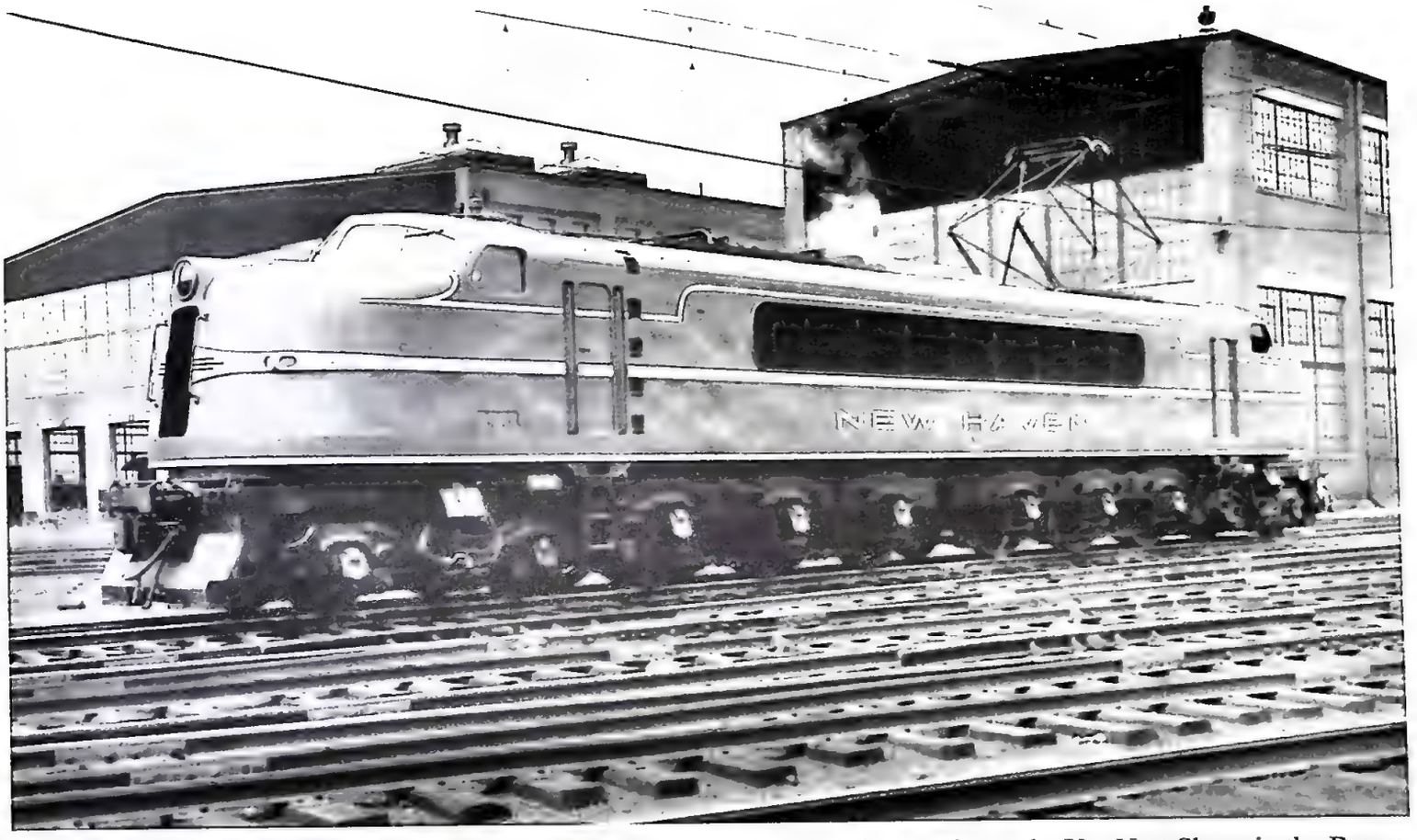
CLASS EP-4

EP-4	0361 – 0366	GE	1938

After the Great Depression, the New Haven was interested in replacing more of its electric power for main line passenger service. In 1937, it awarded a contract to General Electric to build six new passenger electric locomotives for delivery in 1938. Based on the success of the 2-C+C-2 wheel arrangement, the new locomotives would have that wheel arrangement, but with a streamlined carbody differing in styling from the GG1. These units had to be more powerful than the #0351 series in order to handle 20-car trains to Penn Station, but they could not exceed the weight restrictions of the Park Avenue viaduct. Their continuous horsepower was rated at 3600hp, but with a short time rating of 7,600hp. Each driving axle had a GE A-622-A twin motor and larger cooling blowers to improve the short time rating over the EP-3. During the 1940s, they were assigned a class of EP-4. In 1948, #0366 became #0360 and in 1950 the "0" prefix was dropped in the road number. Number 365 was the last of the EP-4 class to operate, with #363 being scrapped first after the Bridgeport wreck of June 14, 1955, and the remainder condemned in mass in November 1963.



On the Motor Storage pit at New Haven, EP-4 #360 waited for its next run on August 2, 1950. Renumbered from #0366 in May 1948 and the "0" removed from in front of its number earlier in 1950, #360 was ready for service. In the "layer cake" paint scheme, #360 had silver gray pin stripes on its carbody sides and a wide stripe down each nose. (M. D. McCarter)



At the time of delivery, May 18, 1938, class EP-4 #0361 was being placed in service at the Van Nest Shops in the Bronx. Number 0361 was New Haven's first streamlined electric locomotive. With a 78:23 gearing, these EP-4 "motors" could operate up to 93 MPH. (Collection of NHRHTA-Inc.)

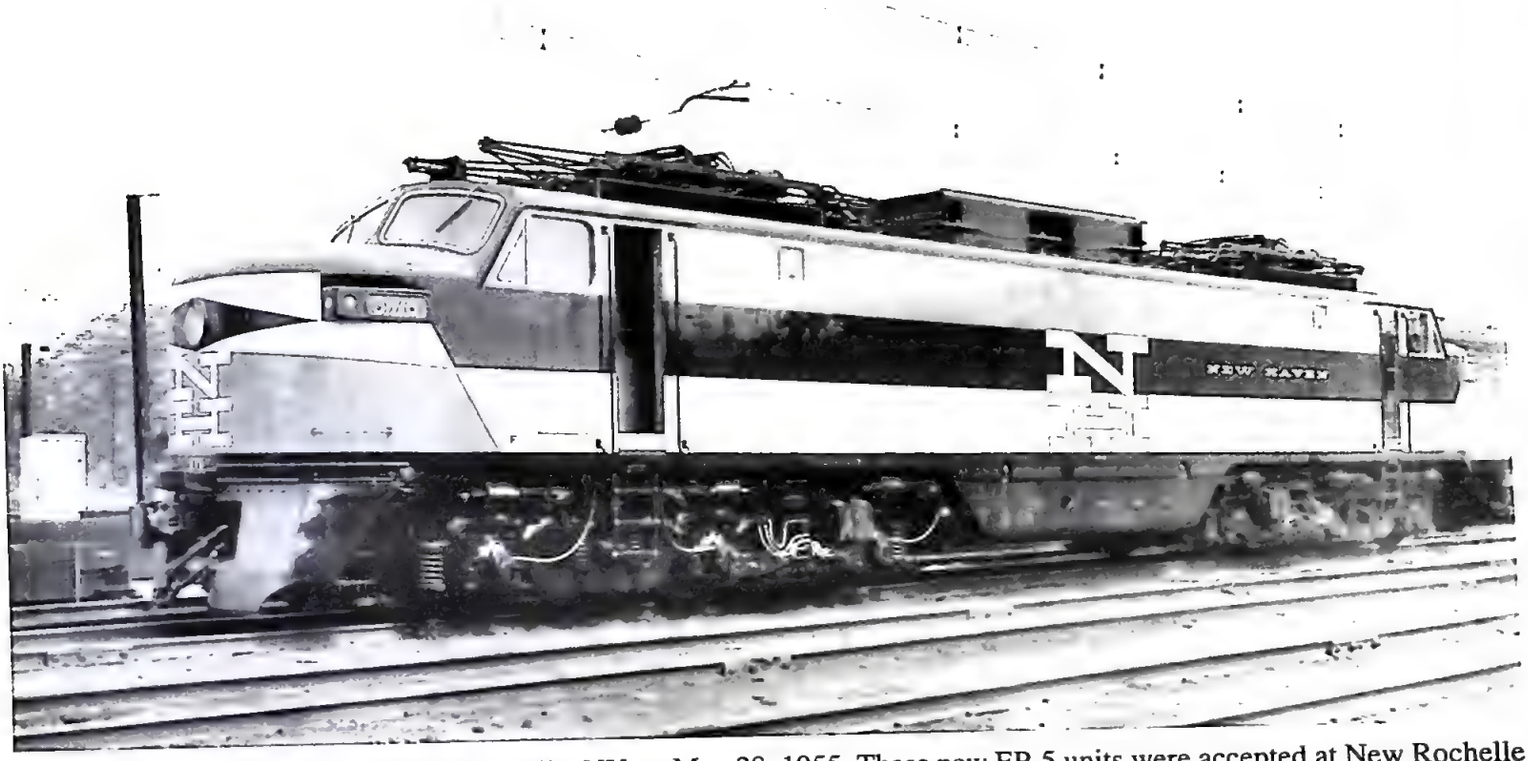
A GE builders photo shows New Haven #0366 on a high bank, possibly at the Erie plant. Located on the roof line over the engineer was the steam heating boiler stack for this 216 ton 2-C+C-2 locomotive. Renumbered in May 1948 to #0360, this electric locomotive remained on the roster until November 1963. (General Electric, Bob's Photo collection)

CLASS EP-5

EP-5	**370-379**	**GE**	**1955**

Looking for new electric power, the Dumaine administration placed an order for ten new 4000hp electric passenger units in 1954. Based on ignitron rectifier technology originally developed by Baldwin-Westinghouse for the PRR, GE built the ten double-ended cab units for delivery in 1955. The units had to comply with the Park Avenue viaduct weight restrictions and also had to operate on either the 600 volt DC or 11,000 volt AC power source. Using diesel type six-wheel trucks and GE 752 traction motors, the units had a weight of 350,500 pounds. The twelve ignitron rectifier tubes converted the AC power to pulsating DC with the DC current smoothed out through a smoothing reactor. Each unit had two AC pantographs located on the roof and accelerating resistors located between the pantographs in a box section with a blower. Two steam generators, one located at each end, provided steam heating for the train. Between the time the locomotives were ordered and delivered, the McGinnis administration took control of the New Haven. Mrs. McGinnis hired Herbert Malter of Knoll Assoc. to design a new color scheme for the 370s (red, white and black) with a new N over H logo. After a few design problem corrections, the "JETS" as they were called, took over the premier passenger assignments. With the closing of Van Nest shops in 1959, the units suffered under deferred maintenance. Authorized by the bankruptcy trustees, all ten received overhauls in the early 1960s and lasted into the Penn Central Era.

Newly placed in service, #370 made a station stop at Stamford with a Penn Station train in 1955. As the engineer waited for the conductor's signal, the fireman looked back over the train consist. Number 370 was built just in time for the new McGinnis era color scheme of red, white and black.



Newly delivered, #376 was at New Rochelle, NY on May 28, 1955. These new EP-5 units were accepted at New Rochelle for tax reasons before being placed in service. You could just smell that new paint! (Collection of NHRHTA-Inc.)

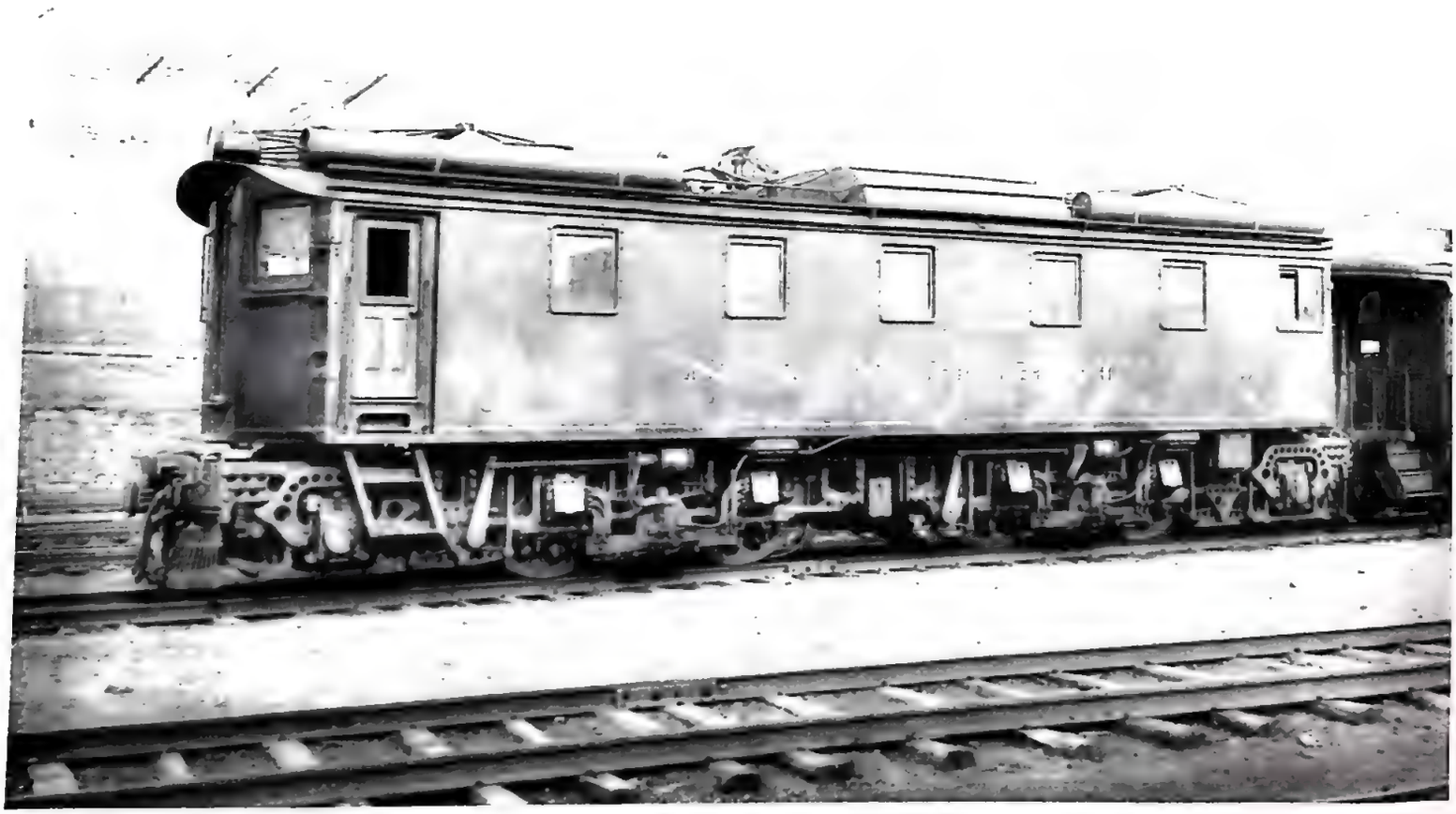
Looking down on EP-5 #378 in the pit at Penn Station New York, one could find the roof details of this 4000hp electric locomotive. The small third rail pantograph mounted on the roof behind the AC pantograph and Hancock air whistle at each end were part of the details. The GE designed screened carbody side vents had been added during the 1955 modifications.

CLASS EF-1

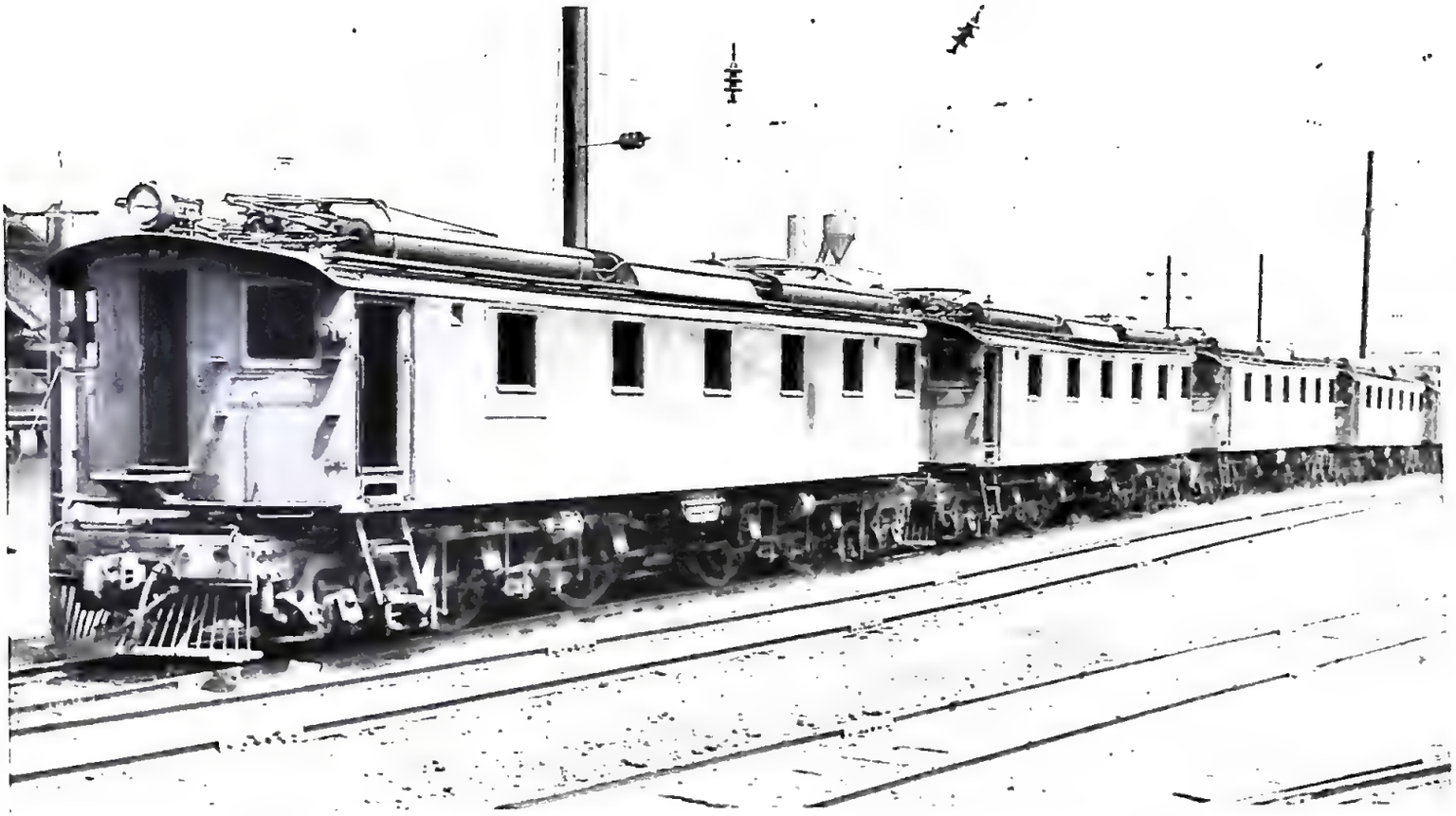
EF-1	**073-075**	**BW**	**1912**
EF-1	**076-0111**	**BW**	**1912-1913**

From the test locomotives of 1910 and 1911, the New Haven used the frame and carbody from locomotives #071 and 072 built by Baldwin-Westinghouse as the basis for the class EF-1 "motors" for AC electric freight service. The traction motors used in the geared Quill drive which became standard for the EF-1 locomotive were the twin Type 409 motors (a set of twin motors for each driving axle) tested in the experimental #069. During 1912 and 1913, Baldwin-Westinghouse built thirty-nine of these EF-1 units numbered #073-0111 with a 1-B+B-1 wheel arrangement. The first three, #073-075, were equipped for AC-DC operation, but the remainder were AC only. After the delivery of more EP-2 passenger motors in 1928, the first three EF-1 units were stripped of steam generators and DC equipment and regeared for freight service only. The 219,500 pound EF-1 freight motors, #076-0111, were rated at 1,616 continuous horsepower each. Geared for a maximum speed of 45 MPH, the overall length of the unit was 50-foot 0-inches between coupler pulling faces. Main drivers were 63 inches in diameter and the idler trucks had 36-inch wheels.

After almost twenty years of service, thirty-seven of the EF-1 freight motors had hauled 179,076,000 ton miles of freight, averaging between 150 and 250 miles per day. First of the fleet to go were #077, destroyed on the Long Island Rail Road in December 1934, and #097 in November 1935 after rear-ending a freight on the drawbridge at Westport, CT (#097 went into the river). As trains became longer and heavier, the units were used in multiple two, three and four unit sets. After a massive retirement drive in 1953, only ten EF-1 units remained, #79, 81, 83, 86, 91, 94, 96, 99, 100 and 111, with the 0 prefix dropped in 1950. These last ten were retired by 1957.



Experimental electric locomotive #071 was built by Baldwin-Westinghouse in 1910. Its 1-B+B-1 wheel arrangement became standard for the class EF-1, but the Type 403 traction motors not copied for the EF-1. AC-DC #071 became a freight only "motor" in 1928 and was stripped of its third rail shoes. In 1942, #071 and 072 were sold to the B&M for operation in Hoosac Tunnel, becoming B&M #5007 and 5008.



Six freight motors led by #073 waited at Bay Ridge yard on June 30, 1933. Until the arrival of the EF-3 units in the 1940s, the EF-1 units were the backbone of electric freight power for the New Haven. Number 073 was the first of the EF-1 group, built by Baldwin-Westinghouse in February 1912, originally equipped with both a steam boiler and third rail shoes. (Collection of NHRHTA-Inc.)

Coupled with #087, "motor" #084 was in a three unit consist. Newly repainted, #084 remained in the EF-1 group until condemned in May 1953, a classic box cab "motor" from New Haven's early electrification years.

EF-1 #0110, plus three other units, roared past Fremont Tower on February 21, 1948. With larger trains in the 1940s, more units were added to increase the hauling capacity of these box cab motors. For a one hour rating, each unit produced about 1,600hp. (Norton Clark collection)

At Ridgewood, NY, the #100 plus #96 and possibly #109 rolled a freight for the New Haven on July 10, 1955. If one of the streamlined EF-3 motors was not available, three of the EF-1 units could handle the freight until their final retirement in 1957. (Norton Clark collection)

CLASS EF-2

EF-2 **0112-0116** **ALCO-GE** **1926**

In 1925 General Electric made a successful bid to assemble five freight electric locomotives for the New Haven. Built by Alco-GE in June 1926, class EF-2 "motors" #0112-0116 joined the New Haven roster. These were motor-generator units where the 11,000 volt AC overhead was stepped down to 2,300 volts to run a large AC motor coupled to a D.C. main generator. The generator produced DC current for the four traction motors of the 1-B+B-1 wheel arrangement with 42-inch wheels. This large motor-generator set increased the weight of the unit to 281,400 pounds vs. 239,000 pounds for an EF-1. The units could MU and were used on freights in pairs, but they could not MU with the earlier Baldwin-Westinghouse EF-1 "motors." With a reduction in freight traffic after World War I and the delivery of EF-3 units during World War II, the five EF-2 units were condemned in February 1948, however #0113 and 0114 remained at Van Nest shops for many more years to power a 600 volt test third rail section in back of the shops. For over the road trips, the crews liked the good riding qualities of these EF-2 units.

New Haven class EF-2 "motor" #0115 waited in the line up of display units at Van Nest Shops on May 3, 1938. Built in June 1926 by Alco-GE, #0115 was condemned ten years after this photograph was taken with the rest of the class. (George Votavia)

CLASS EF-3

EF-3	**0150-0154**	**BW**	**1942**
EF-3a	**0155-0159**	**GE**	**1943**

In 1941, the New Haven placed orders for ten new electric freight locomotives, five to be built by Baldwin-Westinghouse and five by General Electric. The #0150 series units were based on GE designs of the #0361 series, but without the Park Avenue viaduct restrictions. With an 89:18 gear ratio, these motors could operate up to 65 MPH and had a starting tractive effort of 90,000 pounds. The twenty-two notch throttle with "buck and boost" allowed sixty-six throttle settings for the engineer. In 1944, the #0150-0154 group acquired steam heating boilers for dual freight or passenger service, but the entire group of ten never received DC equipment for operation in third rail territory. Each EF-3 unit could haul about as much as three EF-1 units, but at a higher speed. The new EF-3 freight "motors" replaced many EF-1 units and by 1948 all of the EF-2 "motors." During the late 1940s and early 1950s, the steam boiler equipped #0150-0154 group often handled large passenger trains on the Penn Station route. When electric locomotives were out-of-favor by the Alpert administration, the EF-3 units went into storage and all were retired in 1959.

New Haven class EF-3 "motor" #152 waited at motor storage in New Haven in the early 1950s. To make them dual service, #0150-0154 received boilers in 1944 and were changed to a class EF-3b for both passenger and freight service.

Stopped at the Pelham drawbridge in the Bronx on May 30, 1947, EF-3 #0153 hauled a freight on the Harlem River Branch. Geared for 65 MPH operation, these motors had a tractive effort of 90,000 pounds, a great locomotive for freight service. (George Votavia)

Built by General Electric in 1943, the EF-3a group, #0155-0159, never had steam generators applied for dual service. Motor #0156 was at Motor Storage in New Haven on September 14, 1947.

CLASS EF-4

EF-4 **300-310** **GE** **acquired 1963** **(ex N&W 231-241)**

Under the guidance of the bankruptcy trustees for the New Haven, the railroad purchased twelve used General Electric 3,300hp freight electric locomotives from the Norfolk & Western in 1963, after the N&W stopped electric operations on June 30, 1962. These EL-C class electric locomotives developed 98,500 pounds of tractive effort in a C-C trucked 69-foot 6-inch long locomotive. The twelve water cooler ignition rectifiers produced DC current for the #752 GE traction motors. Purchased at a very low price, the New Haven acquired eleven running electrics and one for parts. With the help of GE personnel, all eleven units were overhauled at New Haven Lamberton Street Shop and painted a red-orange scheme with three stripes and a large black N over H logos. Trucks and frames were also painted black. Between October 1963 and June 1965, all eleven returned to service in the NH. Two, #301 and 305, went to service with Faively pantographs. Using the Virginian bus jumper between units, only one pantograph was needed for the powering of two units. Originally built for the Virginian Railroad in 1956 and 1957 as class EL-C #130-141, they became N&W #230-241 in 1959 at the time of the December 1, 1959 N&W merger. N&W converted electric #230 to a diesel booster unit #180 in July 1962, and it in turn was purchased by the New Haven for spare parts. When the New Haven merged into Penn Central, NH #300 and 302-310 became PC #4601-4610 with wrecked damaged #301 just held for parts. In turn, PC #4601-4610 became CR #4601-4610 in the Conrail merger of 1976. All ten received solid-state diode panels to replace the ignitron rectifier tubes at Harrisburg Diesel shop and were repainted Conrail blue.

At Cedar Hill Yard motor pit, EF-4 #301 waited with #306 on July 5, 1965, about two years after being placed in service on the New Haven. EF-4 #301 was one of two, #301 and 303, to receive the Faively pantograph, and this single arm pantograph lasted until close to the PC merger date. Later accident-damaged #301 was set aside by the New Haven, and it never became an active unit on the Penn Central. (M. D. McCarter)

After the New Haven trustees approved putting the wire back up at Oak Point in 1963, the New Haven starting running electric freight service into the location. One year later on August 2, 1964, #305 with #302 were on the power storage track at Oak Point. The bus jumper at the rear of #305 allowed operation for both units with only one pantograph. Number 305 had a standard Virginian scissors pantograph. Built by GE in December 1956 as Virginian #136, it became N&W #236 in December 1959 and New Haven #305 in late 1963. (M. D. McCarter)

In the late 1960s, EF-4 "motors" #307 and 305 operated through Rye, NY handling a block of reefers. The bus jumper between #307 and 305 allowed single pantograph operation for the two units. Former VGN #136 (later N&W #236) became 394,000 pound electric #307 for the New Haven. Later the unit became PC 4607 in January 1969 and CR 4607 in April 1976, a five owner electric locomotive. (Norton Clark collection)

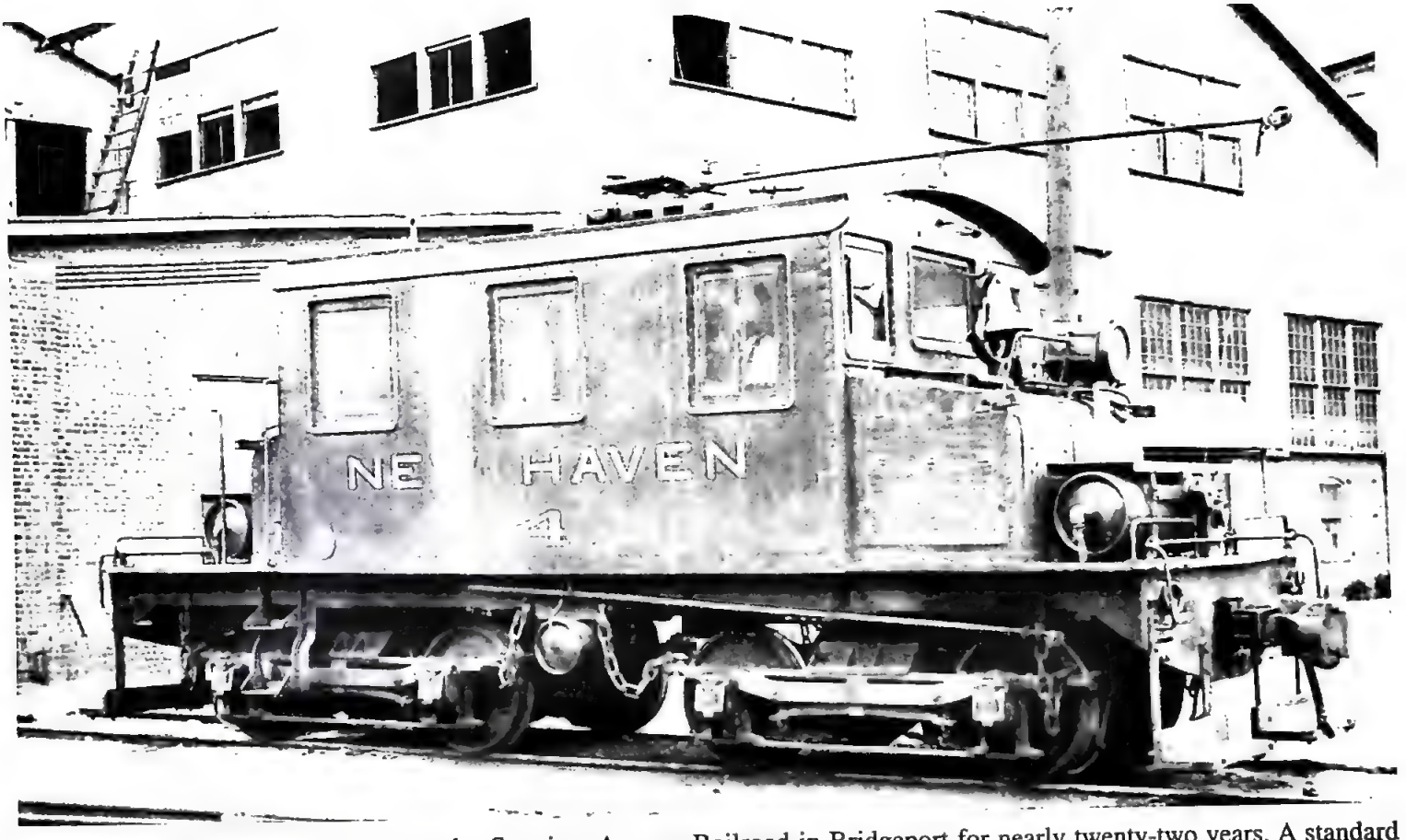
CLASS EY-1

EY-1	**3-4**	**BW**	**1914**
EY-1a	**5-6**	**BW**	**1924**

The New Haven had two DC trolley type electric freight operations in Connecticut, the first being the four mile Manufacturers Railroad at New Haven, CT. Under New Haven control since 1907, the line had two very small four-wheel "motors" numbered 1 and 2. Operating around the plants at Belle Dock in New Haven with some street running, the New Haven RR replaced the original two motors with two new Baldwin-Westinghouse "motors" numbered 3 and 4. They were standard 30-ton steeple cab "motors" delivered in 1914 and MU equipped so the two could be operated together. In 1924, "motors" #3 and 4 were replaced by larger DC steeple cab "motors" #5 and 6, also built by Baldwin-Westinghouse. The newer larger 56-ton #5 and 6 took over operations at Bell Dock until 1948 when they were replaced by diesel units. Units #5 and 6 were then sold to Capital Transit in Washington, DC.

The other operation was a one-mile street-type trolley freight railroad in Bridgeport, acquired by the New Haven in 1931. This Seaview Avenue Railroad was operated by the New Haven from 1931 to 1953 with electric locomotives until diesel switchers took over. Smaller trolley motors #3 and 4 were used on this line to move freight cars to and from the New Haven yard in Bridgeport. Both #3 and 4 were condemned in June 1953.

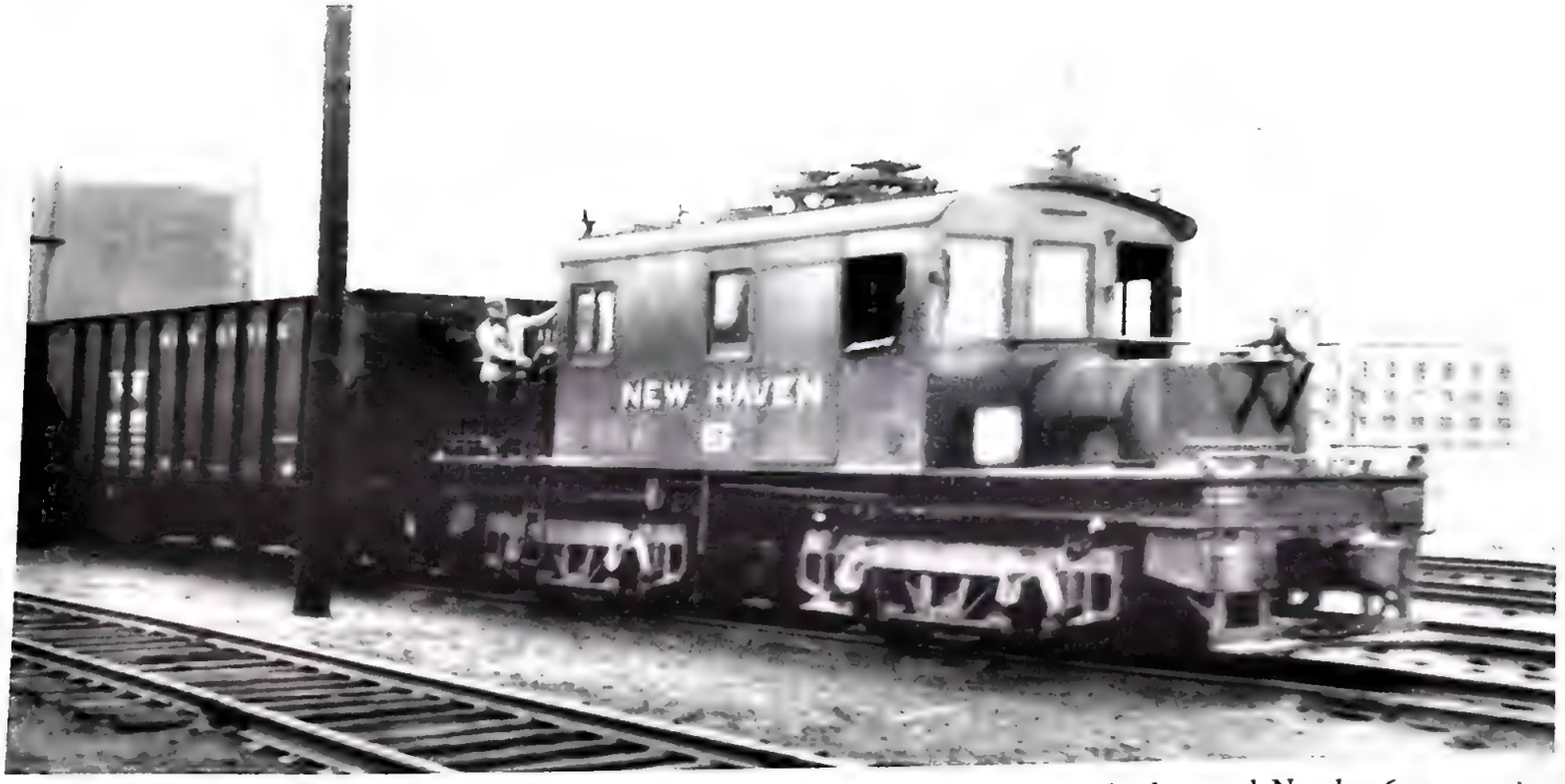
Resting at the shops with both trolley poles removed, number 3 was photographed in about 1953. Purchased from Baldwin-Westinghouse in 1919, #3 had a weight of about 30 tons and operated on the Manufacturers Railroad at New Haven. In 1931, #3 and twin #4 were transferred to the Seaview Avenue Railroad in Bridgeport, CT when the New Haven took over the operation of that railroad. (M. D. McCarter)



Number 4 switched freight cars on the Seaview Avenue Railroad in Bridgeport for nearly twenty-two years. A standard Baldwin-Westinghouse steeple-cab electric locomotive, #4 could maneuver the sharp radius curves of a street railroad. With an extra trolley pole held in brackets on the locomotive frame, #4 was ready for service at Bridgeport in the late 1940s. (Norton Clark collection)

Coupled to a wooden C&O box car, number 4 was at the New Haven yard in East Bridgeport. The MU receptacle on #4 was located on the platform centered over the coupler. When originally operated at Bell Dock, #3 and 4 were often used in multiple. (Norton Clark collection)

For its monthly inspection and lubrication, #5 or 6 would be hauled from Bell Dock to Motor Storage in New Haven. With a longer frame, EY-1a motors #5 and 6 had their main reservoirs located under the frame between the trucks. This 56-ton DC "motor" was much smaller than the large EP-2 on the next track at Motor Storage when photographed on October 6, 1935. (M. D. McCarter)



EY-1a #6 switched cars at Bell Dock in New Haven in the 1940s with the gas works in the background. Number 6 was moving a cut of empty 50-ton hoppers in the yard. On the #2 end in back of the headlight and sand box was the traction motor blower, needed to blow cool air through the TMs when the motors were hot from hauling heavy loads. (Norton Clark collection)

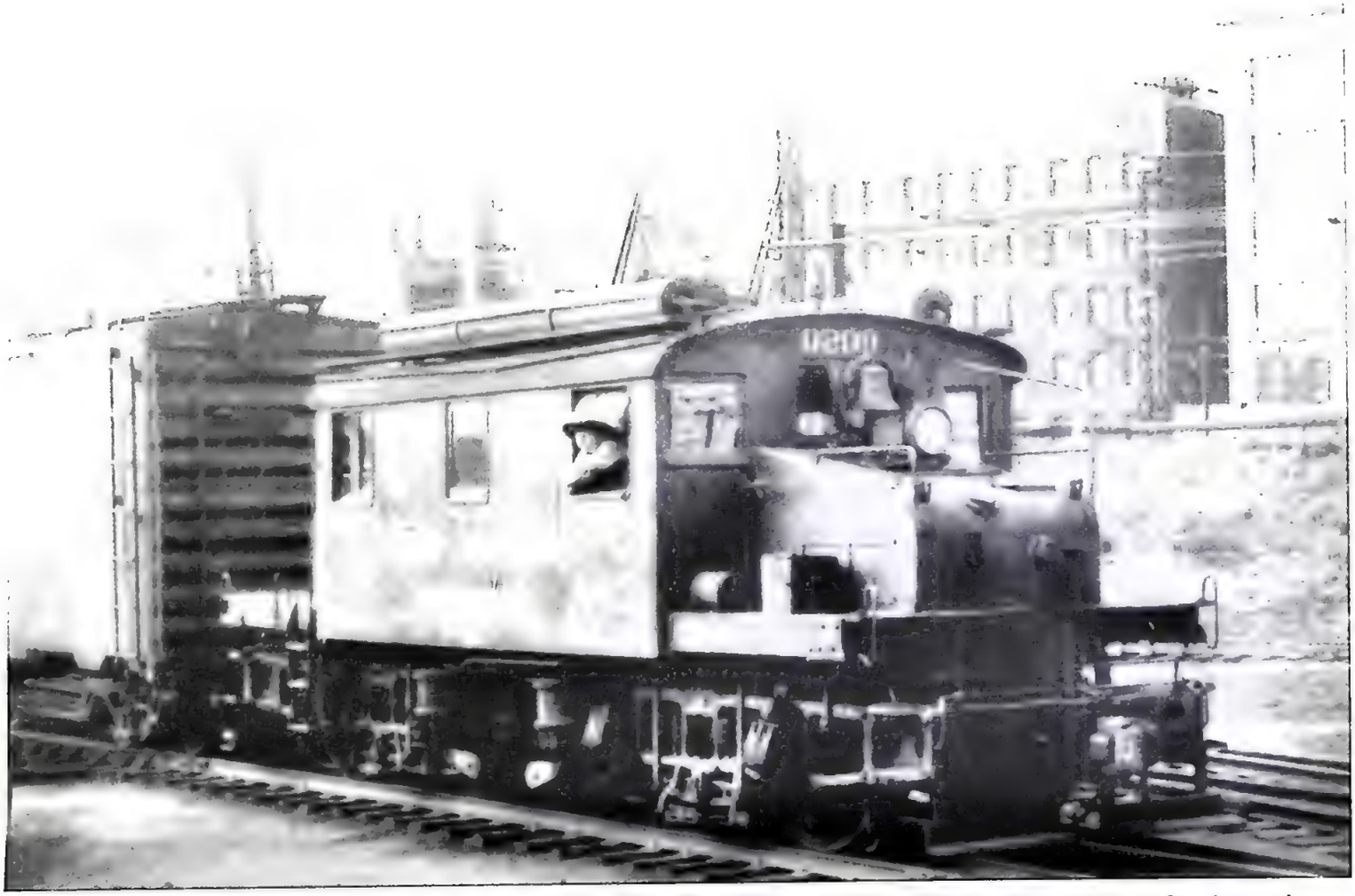
CLASS EY-2

EY-2	**0200-0214**	**B-W**	**1911**
EY-2a	**0215**	**B-W**	**1911**
EY-2b	**0218-0223**	**B-W**	**1926**
EY-2c	**0224**	**B-W**	**1911 (ex NY, W&B #701)**

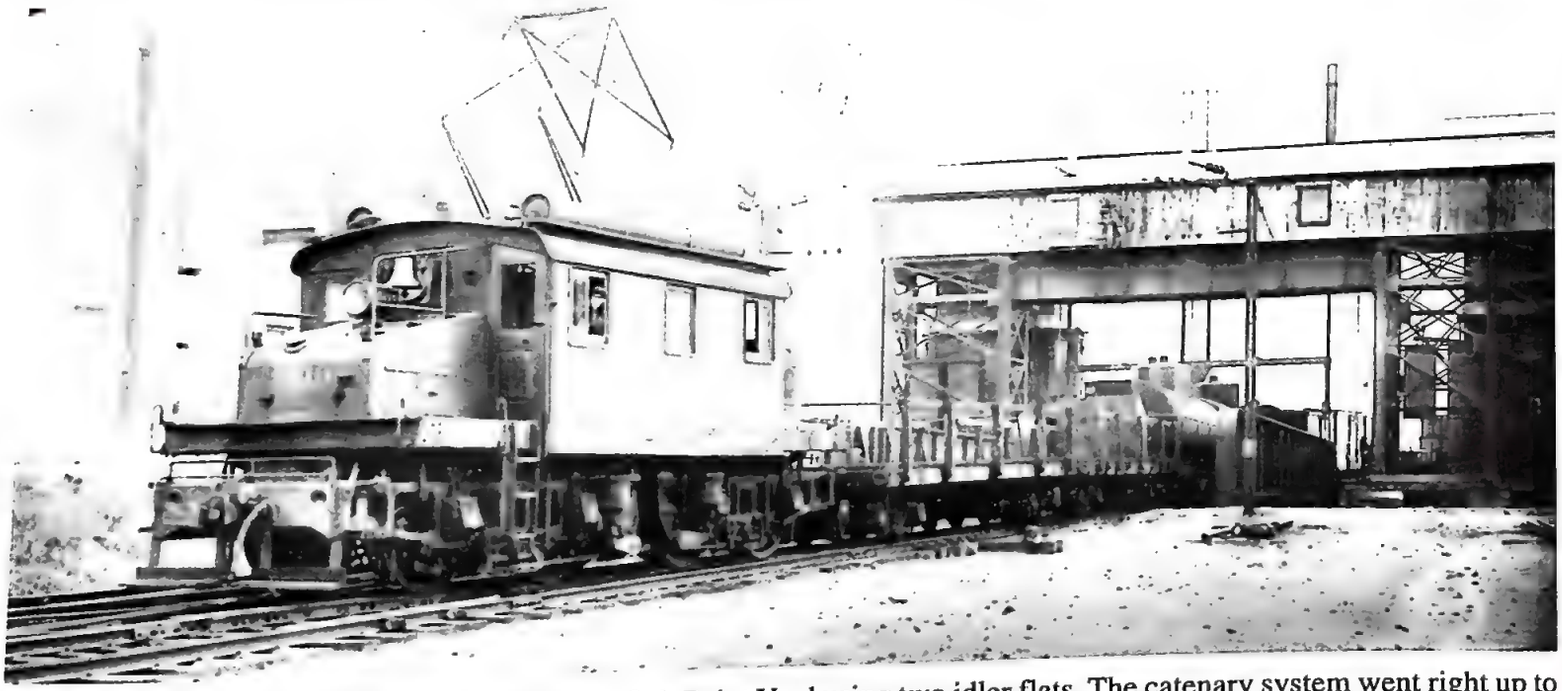
As the New Haven expanded its electrification, a need developed for an electric switch engine. New Haven ordered one steeple cab B+B switcher for delivery in April 1911 from Baldwin-Westinghouse. Using the standard 63-inch driver with a quill drive, this unit, #0200, developed about 46,000 pounds of tractive effort when starting a train. After a few months of service, fourteen more, #0201-0214, were delivered in August and September. The external modification made in the production run was the shape of the steeple cab slope hoods. During the 1940s, all fifteen were assigned a class of EY-2. One more unit came in September 1911, a single cab #0215, later classed EY-2a. With a small cab, #0215 had one control stand for operation in either direction.

In 1926, the New Haven took delivery of six more units, #0218-0223, later assigned a class of EY-2b. These "motors" came equipped with MU capabilities and were slightly heavier than the original group. The original group (except #0215) later received MU equipment. By the 1920s, five large yards had been electrified on the New Haven, keeping the electric switcher fleet busy. One more electric switcher was added in 1944, the former New York, Westchester and Boston #701, which became class EY-2c #0224 on the New Haven. This EY-2 fleet remained together until 1950, when #0205 was condemned in September. In 1952 and 1953, diesel switchers replaced the remainder of the #0200-0215 (then #200-215) group, and all units went to scrap. From the 1926 built group, #0223 was condemned in November 1950 and the rest in 1957, completing an interesting chapter in New Haven's locomotive roster.

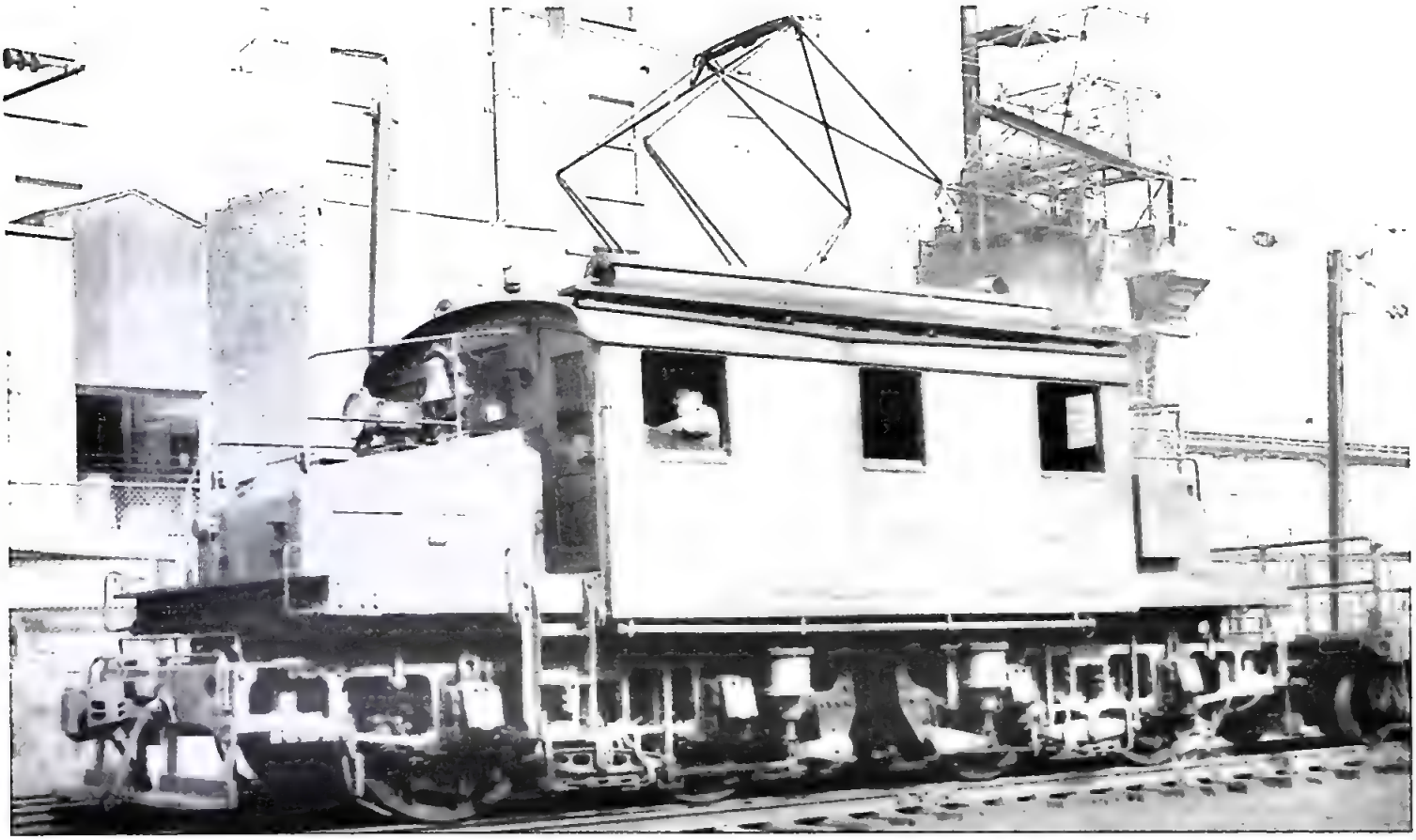
In the line up at Van Nest Shops in the late 1930s, #0207 waited for inspection. Built in August 1911 by Baldwin-Westinghouse, this "motor" served the New Haven well, lasting until condemned in May 1953. Visible in the trucks were the Quill drive and 63-inch wheels. (M. D. McCarter)



Working in the Bronx in 1948, #0209 pulled an MEC box car for customer delivery. Notice the canvas roof at the engineers cab window, a rain shield and sun visor for operation when the window was open. The row of concrete and brick building in the background gave the scene a "look" of the 40s. (Norton Clark collection)



In an early view, EY-2 #0210 loaded car floats at Oak Point Yard using two idler flats. The catenary system went right up to the float bridge to enable these electric locomotives to be used for the floating operation.



The side view of #0211 working with an idler flat at Van Nest in July 1948, showed the "motor" with a few years service (built September 1911) under its belt and a few yard scars on the carbody side. Notice that the brake cylinders acted vertically to apply the brakes on all four wheels of each truck. Condemned in May 1953, #0211 went to retirement with eleven others from the group. (Norton Clark collection)

In the lower yard at Stamford on a winter day in the 1940s, #0214 was among other Baldwin-Westinghouse friends. These EF-1 motors were built within one year of #0214's birth date. The EY-2's cab and sloped hood gave the engineer much better visibility for switching than the EF-1 when used on local freights. (Norton Clark collection)

CLASS EY-2A

EY-2a	**0215**	**BW**	**1912**

With the electrification of yards at Oak Point, Harlem River, Stamford and sections of Cedar Hill in New Haven, the New Haven ordered electric switchers in 1910. The prototype electric switcher, #200, was delivered from Baldwin-Westinghouse in April 1911, and the New Haven went on to receive production units #0201-0214 later in that year. All were steeple cab type units with a B+B type wheel arrangement, but without any DC third rail electrical equipment. These were followed in the same order by one unit, #0215. Number 0215, which later obtained a class of EY-2a, rode on a frame with the same B+B wheel arrangement, but the carbody had a small center cab and long sloping hoods. The operating control stand in the cab faced in one direction only. No others of the class were built, and the unit never received MU equipment. Most photographs indicate that #0215 operated in the Van Nest Shop area. Over the years, changes were made to the carbody, the main reservoirs being moved from on top of the pilots to a position mounted on top of the long sloped hoods (one on each end), and the side sills repaired under the cab with large gussets to prevent sagging. Like most of the first group of EY-2 units, #0215 was condemned in May 1953 as the New Haven moved more diesel switchers "under the wire." With an engine weight of 154,740 pounds, #0215 had a Quill drive, the same as the rest of the EY-2 class, and employed single Type 410 Westinghouse traction motors.

One-of-a-kind "motor" #0215 was at Van Nest Shops on May 31, 1936. Main reservoirs were located on the top of the sloping hoods and the side sills had reinforcement plates applied. (Collection of NHRHTA-Inc.)

CLASS EY-3

EY-3	**0216-0217**	**GE**	**1926**

New Haven tried two motor-generator electric switching locomotives built by General Electric. Built in October 1926, #0216 and 0217 went to the New Haven carrying both a GE and an Alco builders plate. Using a step down transformer to transfer the 11,000 volt overhead power to 2,300 volts, the AC power ran a motor-generator set. The generator in turn produced 600 volt DC to power the four DC traction motors. As opposed to the Baldwin-Westinghouse electric switchers, #0216 and 0217 were box cab style units. With a 211,500 pound engine weight, the units rode on a B+B wheel arrangement with 42-inch wheels and axle hung DC traction motors. EY-3 #0216 was converted to diesel trailer #DT-1 at Van Nest Shops in April 1952, and the second motor-generator switcher, #0217, was condemned from service in December 1952.

Working around Van Nest Shops, #0216 was photographed on September 8, 1935, with its pantograph in the lock down position. Side louvers were the intake for the equipment blower and sand box covers were located beside the number 2 and 4 side panel windows. Each unit had only one side door per side and one cab door at each end. (M. D. McCarter)

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Ready for its local run, EY-2b #0218 waited New Rochelle on October 11, 1936. Its 63-inch wheels with Quill drive were clearly visible through the truck frame. Baldwin-Westinghouse built this electric switcher in August 1926, the first unit in the EY-2b class (#0218-0223). It remained in service until condemned in October 1957. (Collection of NHRHTA-Inc.)

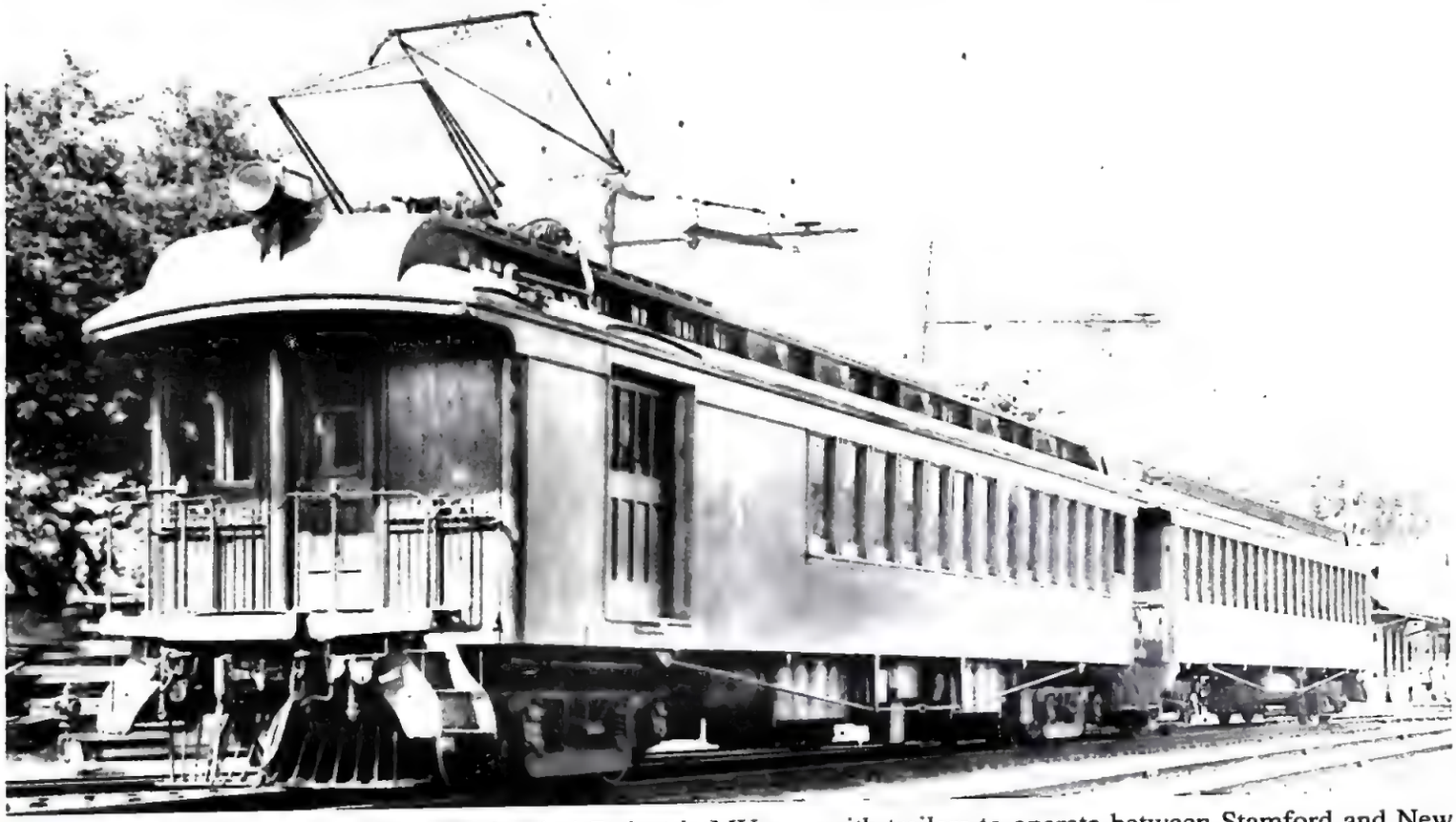
At Stamford on May 19, 1957, EY-2b #220 waited between assignments next to a "washboard" parlor car. Just five more months and this steeple cab "motor" would go into retirement. Looking at the front hood, the equipment blower was in front of the cab window and the cab door on the fireman's side. The MU receptacle was centered on the front platform. (Norton Clark collection)

Working a road local, EY-2b #221 moved through Stamford station on July 25, 1952. With the engine bell ringing, the engineer warned other employees and station platform passengers of the train's movement. The EY-2b's single pantograph reached up to the high triangular catenary wire through the station. (Norton Clark collection)

Being prepared for shipment to the Westinghouse plant at East Pittsburgh, one of the EY-2b "motors" moved between buildings at the Baldwin plant in Philadelphia during 1926. Baldwin built the frame, carbody and trucks for the #0218-0223 group, later called the EY-2b class. (Norton Clark collection)

MU CARS

4011 WOODEN MOTOR COMBINE 4010-4011 OB 1908



The New Haven had two wooden 11,000 volt AC electric MU cars with trailers to operate between Stamford and New Canaan. Both were built by Osgood Bradley in 1908 with GE electrical equipment. In an early photograph, #4010 or 4011 was providing the New Canaan Branch service with its unpowered trailer. (Norton Clark collection)

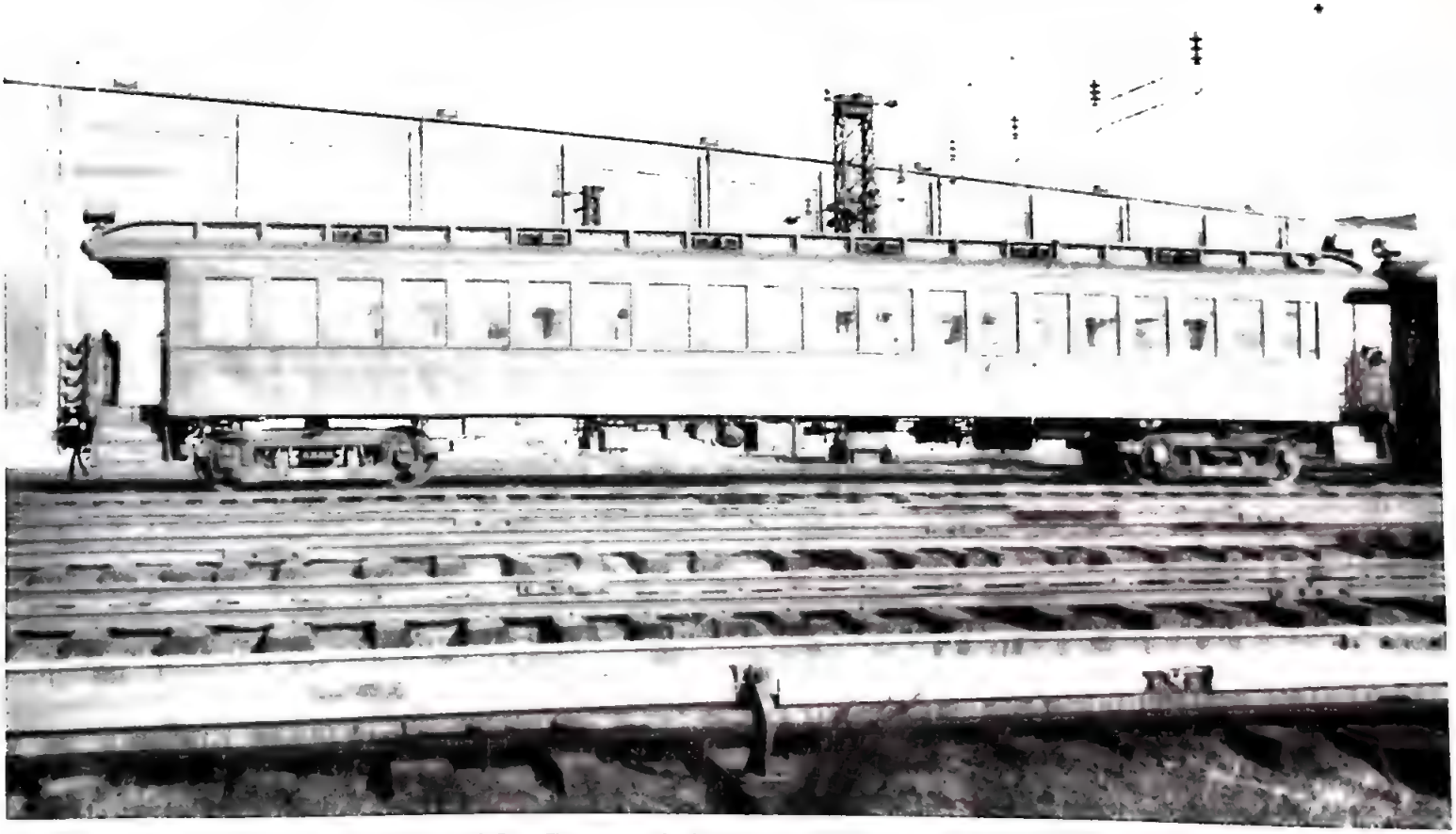
4021 OPEN PLATFORM MOTOR COACH 4020-4023 SSC 1909

Open-platform motors coach #4021 was built by Standard Steel Car Company in 1909, part of the #4020-4023 group. These were part of the first order for four power cars and six trailers, all equipped to operate on either 11,000 volt AC or 600 volt DC for service into Grand Central Terminal. Number 4021 was photographed at Van Nest Shops on December 5, 1937. (Ed Hermanns collection)

4022 OPEN PLATFORM MOTOR COACH 4020-4023 SSC 1909

At Stamford Yard, open-platform motor coach #4022 was photographed on March 3, 1935. Seating seventy-six passengers, this all-steel MU measured 70-feet 10½ -inches in length and rode on trucks with 42-inch wheels. Electrical equipment for this AC-DC MU was supplied by Westinghouse. (Ed Hermanns collection)

4214 OPEN PLATFORM TRAILER 4206-4215 SSC 1912



Between 1909 and 1912, Standard Steel Car Company built sixteen 70-foot, 10½ inch long open-platform trailers to operate with the power cars. The 1912 delivery from Standard Steel Car Co. included trailers #4206-4215. Seating seventy-six passengers, trailer #4214 was at Van Nest Shops on January 29, 1933. (Ed Hermanns collection)

4010 2nd STEEL MOTOR COMBINE 4010 SSC 1914

After the original wooden combine #4010 burned at Talmadge Hill, CT in 1910, it was replaced by a second MU combine #4010 built by Standard Steel Car Company in 1914. This new all-steel car (11,000 volt AC only) seated fifty-eight passengers in a 71-foot 11-inch long body. Photographed at Van Nest Shops on July 19, 1931, this MU car was later rebuilt into combine trailer #4656. (Ed Hermanns collection)

4033 STEEL MOTOR COACH 4028-4040 SSC 1914

Motor coach #4033 waited at New Haven on October 11, 1936, near the Motor Storage yard. In 1914 after the open-platform era, New Haven purchased motor coaches #4028-4040 and trailers #4216-4237 from Standard Steel Car Company. Westinghouse supplied the electrical equipment for both the motor cars and trailers. (Norton Clark collection)

4036 STEEL MOTOR COACH 4028-4040 SSC 1914

The #4028-4040 group of motor coaches measured 71-foot 11-inches long and were equipped for both AC and DC operation into Grand Central Terminal. The indented roof line allowed for maximum operation of the pantographs (low lock down position). Built by Standard Steel Car Company, the electrical equipment was furnished by Westinghouse and installed at the factory. (M. D. McCarter)

4047 STEEL MOTOR COACH 4041-4048 OB 1921-22

Waiting at Stamford Station on March 28, 1954, motor coach #4047 and trailer would provide connecting service to New Canaan. Osgood Bradley of Worcester, MA built the #4041-4048 group of MU cars in 1921-22 and Van Nest Shops installed the Westinghouse electrical equipment. At the same time, Osgood Bradley built trailers #4238-4251. (Ed Hermanns collection)

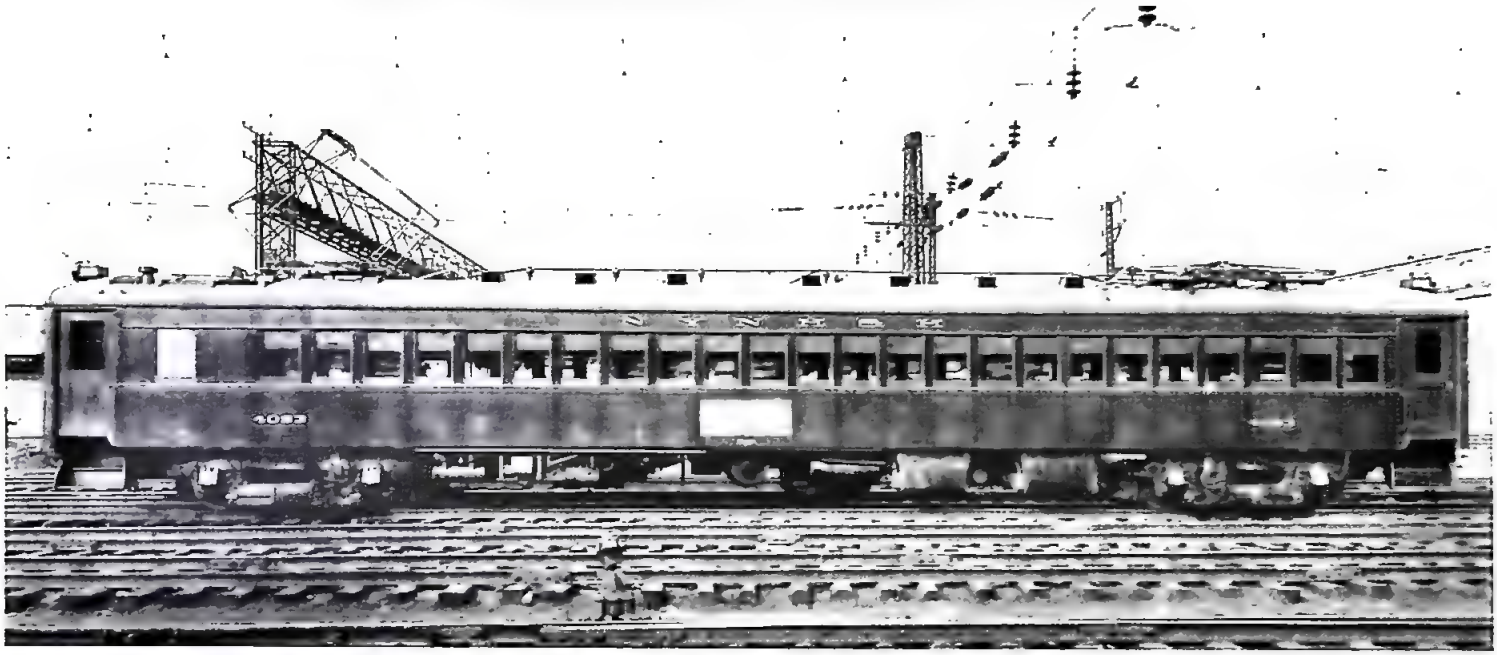
4063 STEEL MOTOR COACH 4060-4063 SSC 1915

In 1915, Standard Steel Car built four AC-only motor coaches, #4060-4063, for service on the Harlem River Branch. These 72-feet ½-inch long all steel cars seated seventy-six passengers. When photographed at Van Nest Shops on September 8, 1935, this MU was an AC-only (GE equipment) car. During 1940-41, the #4060-4063 group was rebuilt for AC-DC operation with Westinghouse equipment and the pantograph mounts recessed in the railroad style roof. (Norton Clark collection)

4071 ROUND ROOF MOTOR COACH 4070-4094 OB 1926

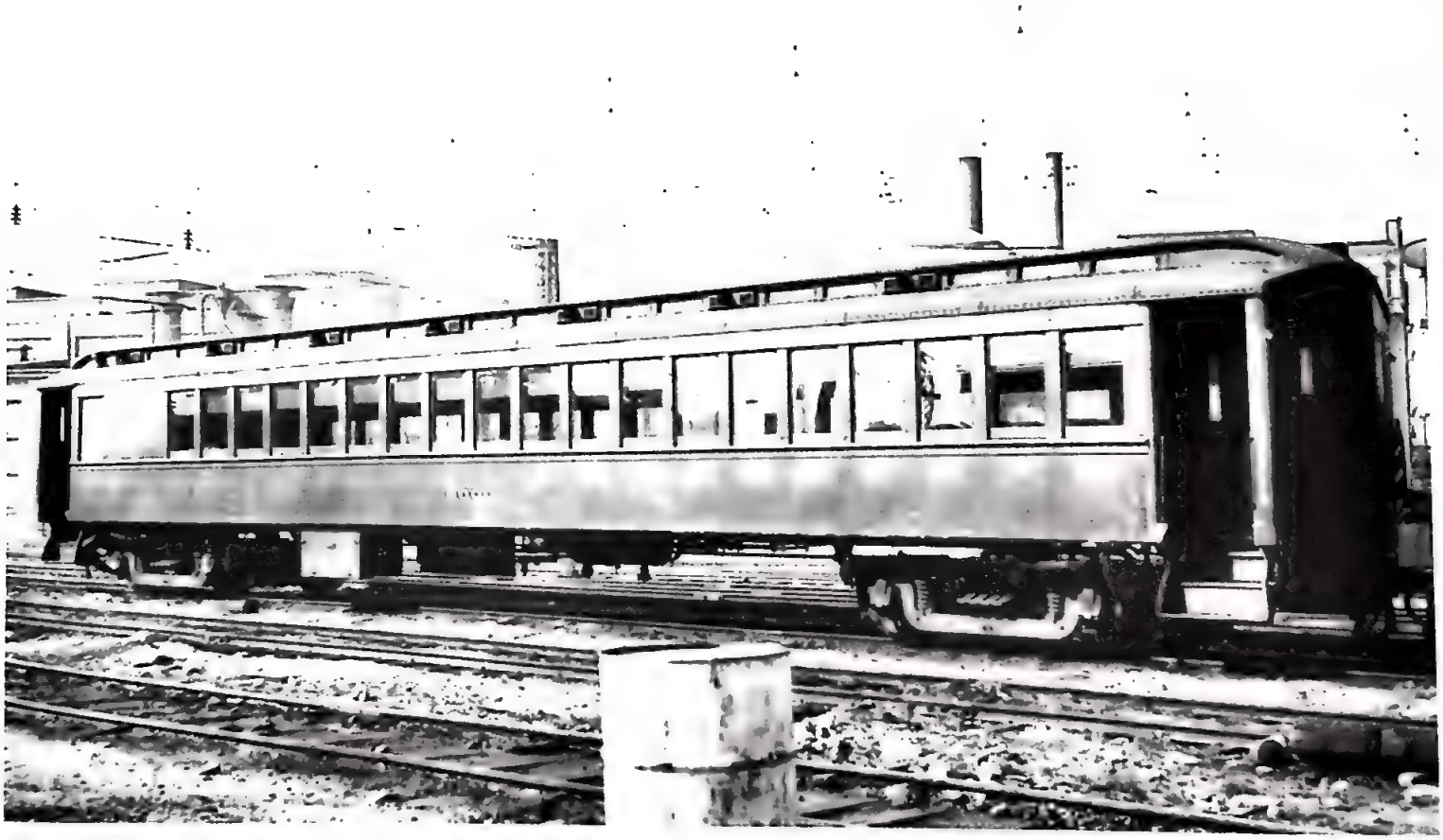
The second of the round roof motor coaches, #4071 was built by Osgood Bradley in 1926, part of the #4070-4094 group. After assembly of this MU car, the builder sent the car to New Haven's shop at Van Nest for the application of Westinghouse electrical equipment. This 79-foot 7¼-inch long car had seating in a 3-2 seating arrangement when photographed at Van Nest Shops on June 5, 1948. (M. C. McCarter)

#4093 MOTOR COACH #4070-4094 OB 1926



A 1926 builders photo shows MU #4093 at Stanford Yard. The #4070-4094 group of round roof steel motor coaches was built by Osgood Bradley with Van Nest shops installing the Westinghouse electric equipment for operation on either 11,000 volt AC or 600 volt DC.

#5000 STEEL CLUB TRAILER #5000-5005 SSC 1915

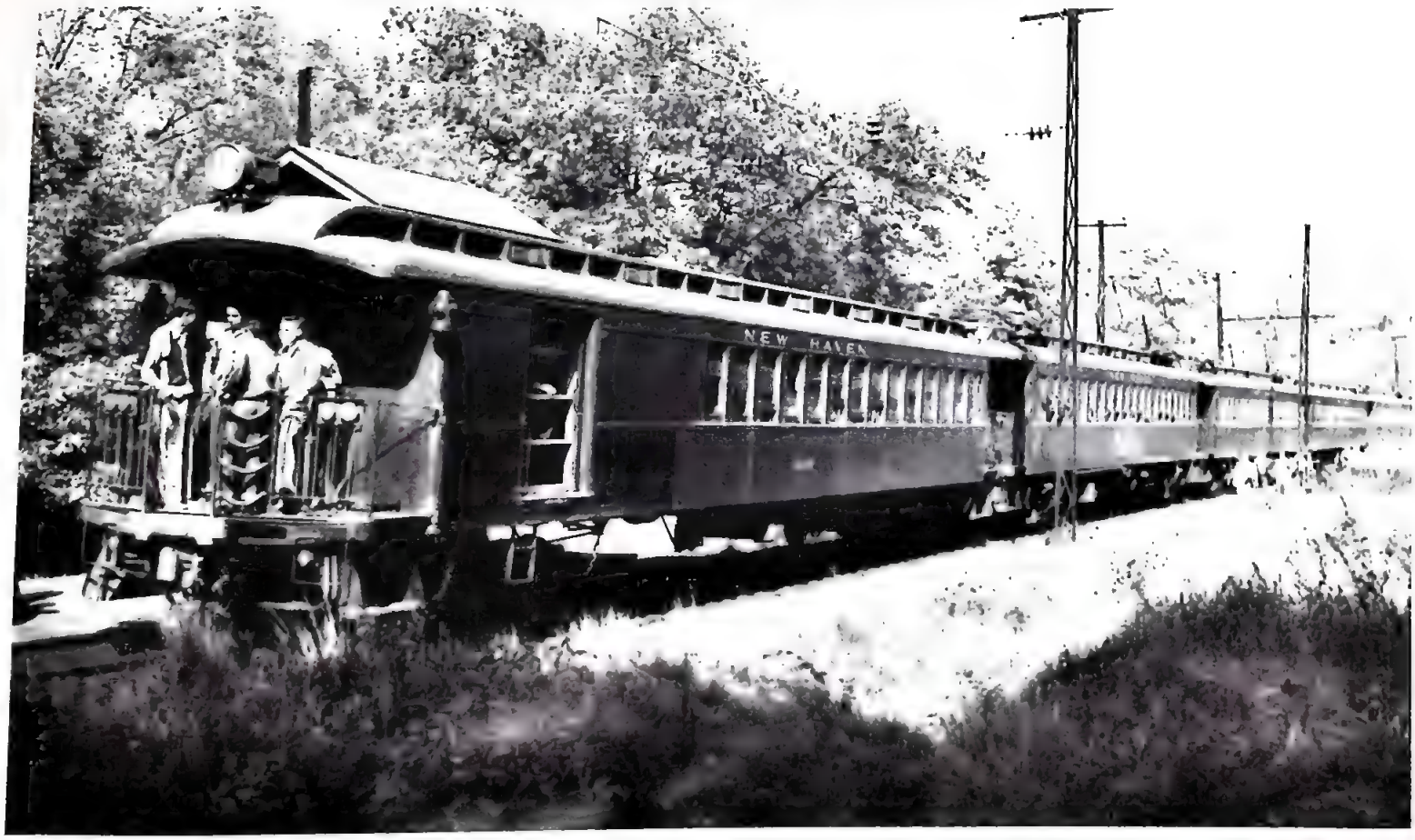


Standard Steel Car Company built six trailer club cars, #5000-5005, in 1915. Seating fifty in easy chairs, the cars had card tables and a steward's section for commuter clubs. Photographed at Van Nest Shops on March 19, 1938, #5000 rode on four-wheel drop-equalizer trucks. (Ed Hermanns collection)

2767 STEEL RPO-BAGGAGE TRAILER 2759 and 2767 OB 1915

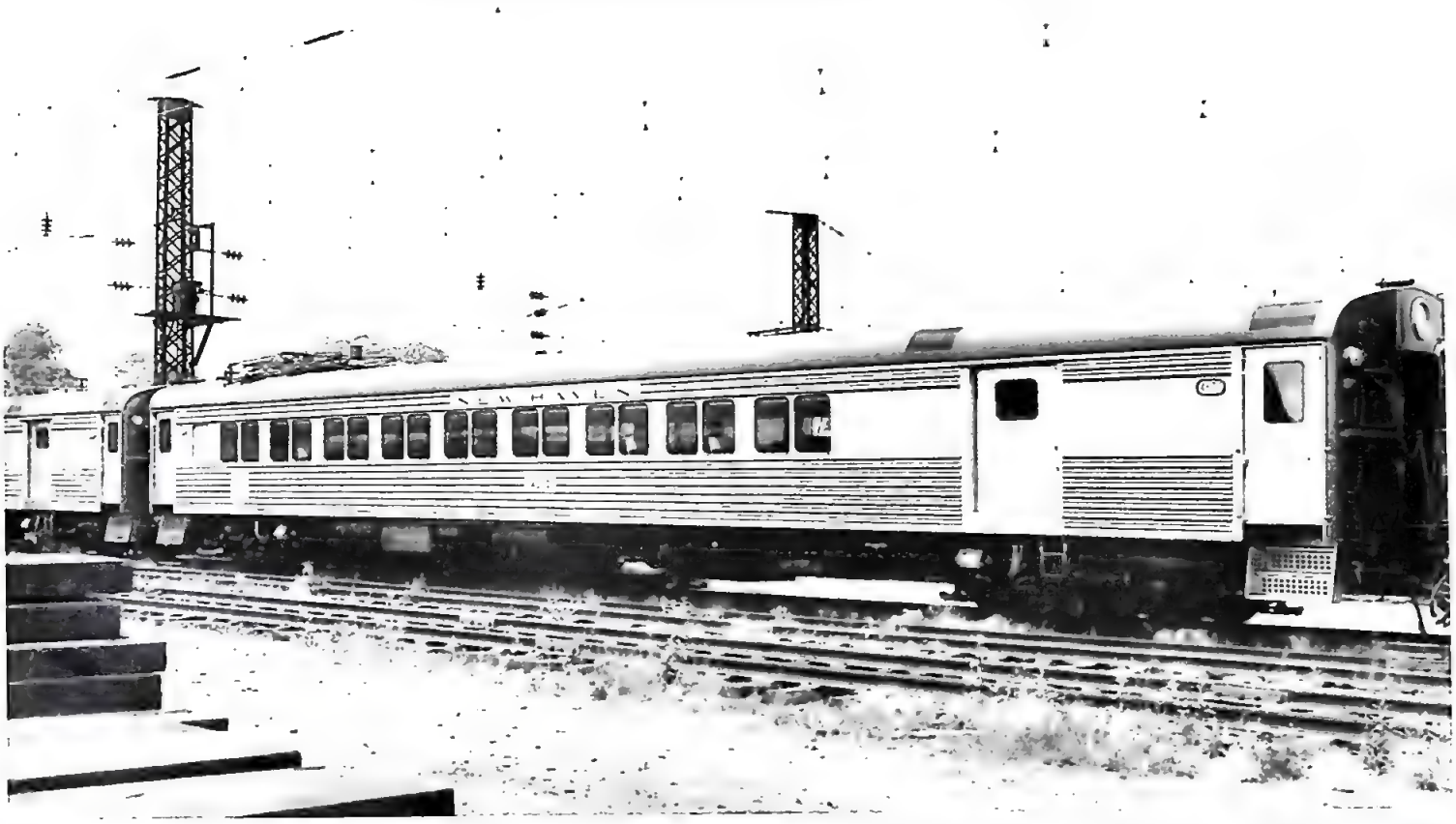
In 1923, the New Haven converted two steam hauled RPO-Baggage cars into MU control trailers. Originally built in 1915, #2759 and 2767 were converted with an operating cab, headlight and MU controls. Photographed at Van Nest Shops on September 18, 1937, #2767 still retained its steam train line and end steam connectors. (Ed Hermanns collection)

4650 COMBINE TRAILER 4650-4651 SSC 1912



On October 4, 1953, open platform combine trailer #4650 was at the end of a six car MU special on the New Canaan Branch. Number 4650 was one of two open platform combine trailers, #4650-4651, built by Standard Steel Car Company in 1912, the only steel open platform MU combines on the system. (Norton Clark collection)

4670-4676 MOTOR COMBINE PS 1954

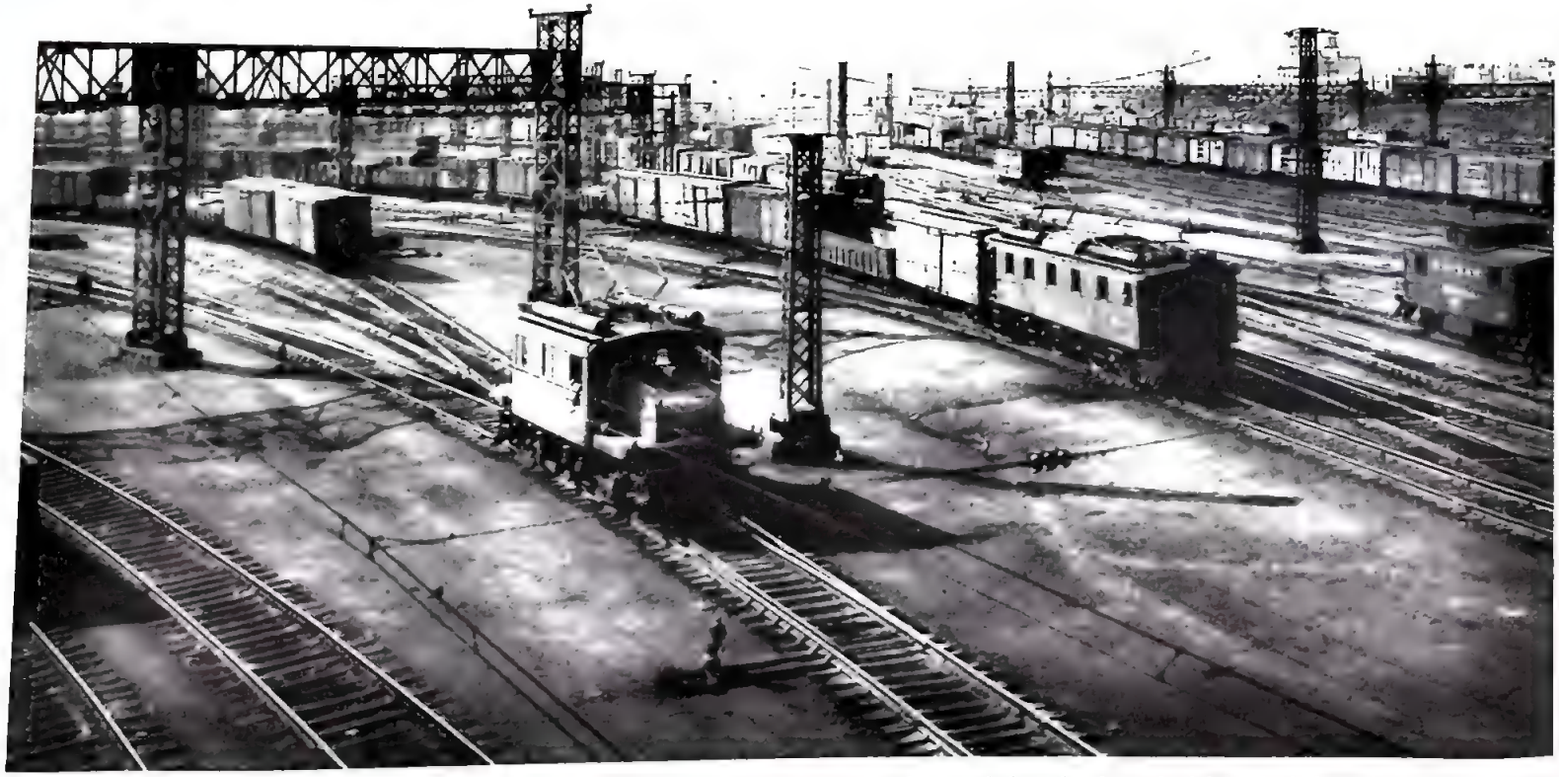


At its Worcester, MA plant, Pullman Standard built seven stainless steel clad MU combines, #4670-4676, in 1954 for the New Haven. First of the series, #4670, was photographed at New Rochelle, NY on June 20, 1954, shortly after delivery. (Collection of NHRHTA-Inc.)

4400-4488 MOTOR COACH PS 1954

New Haven MU cars #4400-4488 were built in 1954 by Pullman Standard at the former Osgood Bradley plant in Worcester, MA. They were motor coaches seating 120 in 3-2 seating and riding on General Steel Casting trucks with four traction motors. Motor car #4417 with its stainless clad sides stayed in the yard at Stamford on May 19, 1957. (Norton Clark collection)

On September 5, 1939, the line up of power at the Oak Point Motor Storage included EP-1s, an EP-3, several EF-1 motors and EY-2 yard "motors." In the background stood Casanova yard with lots of freight cars "under wire." It would be the middle of World War II before streamlined electric power would arrive at Oak Point on a regular basis. (M. D. McCarter)



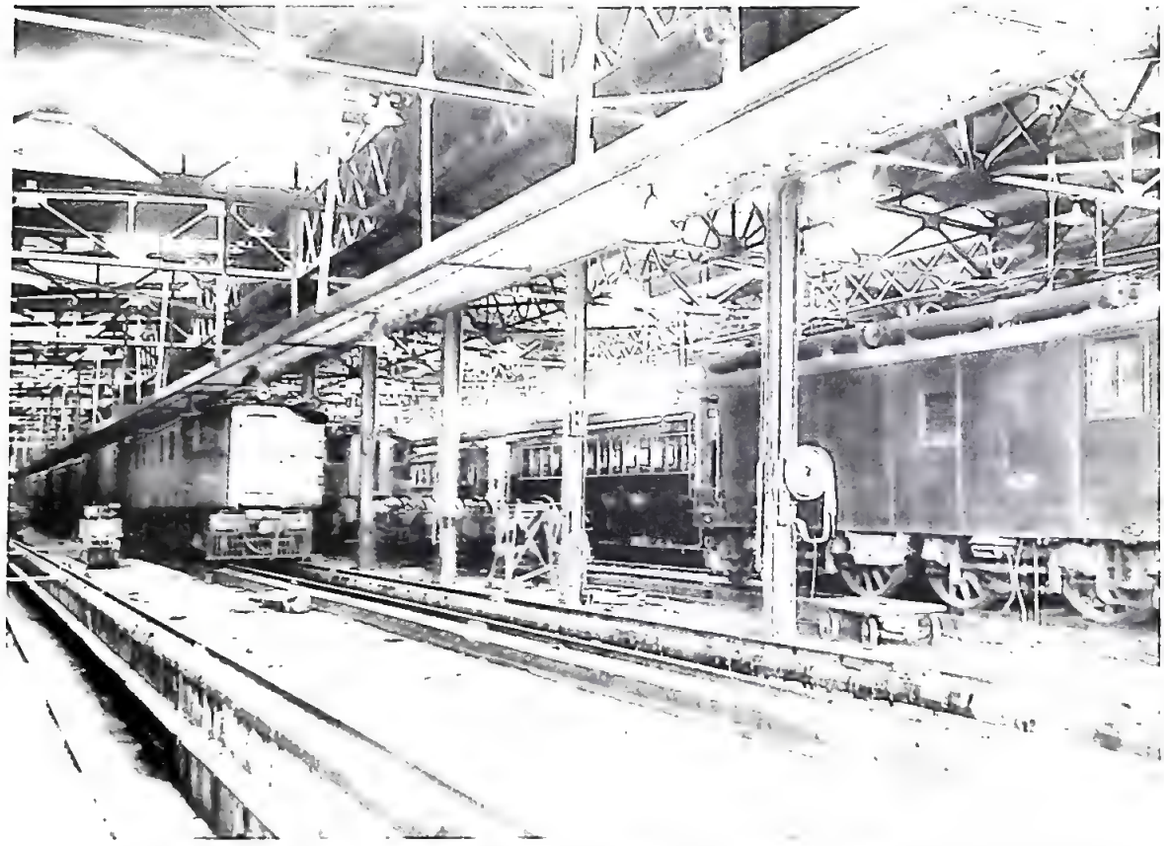
At Oak Point Yard, five to seven class EY-1 electric switchers were used round the clock switching freight cars and loading car floats. In an early 1920s photograph, two EY-1 units worked the yard as an EF-1 with train was ready to depart eastbound with a short freight. (Harry F. Brown – Bob's Photo collection)

STAMFORD YARD

Standing under the wire in the middle of Stamford yard, several MU cars were at the shop as well as in the upper storage yard. One EY-2 handled the yard switching assignment in this electrified yard; however, the water tank and sand tower remained from steam days. (Harry F. Brown – Bob's Photo collection)

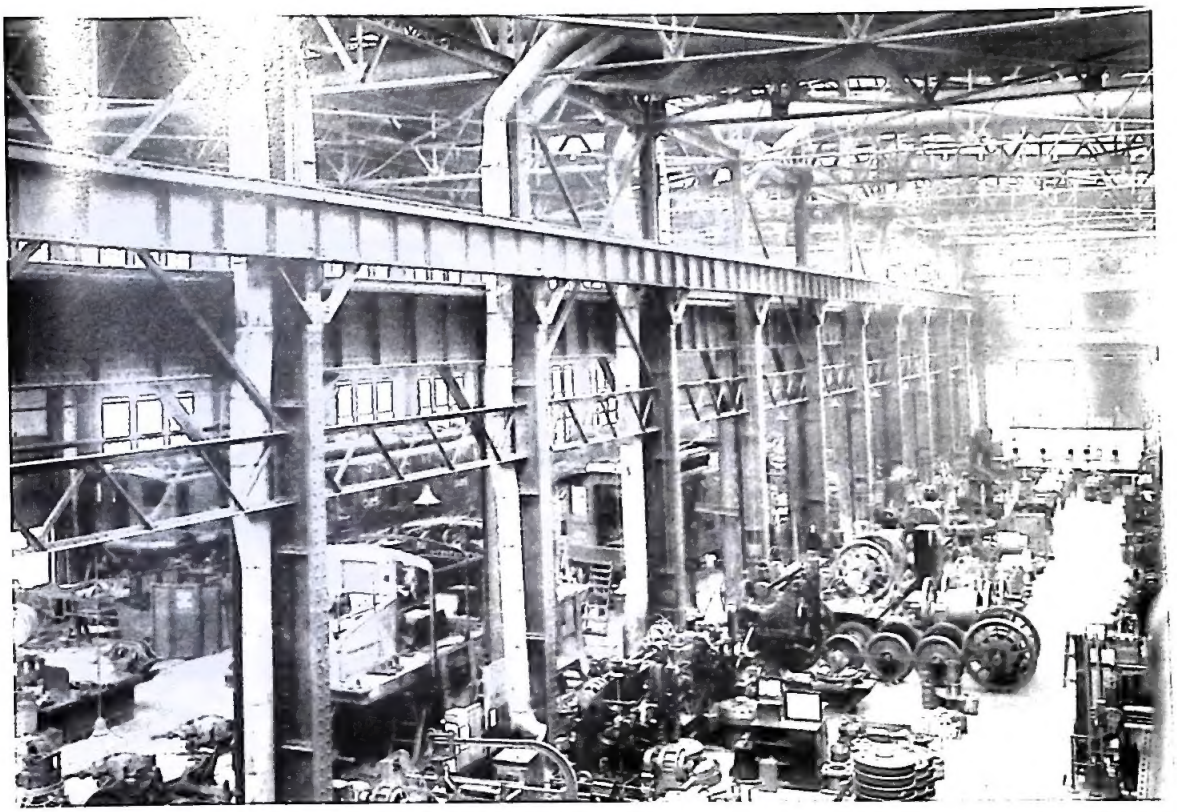
VAN NEST SHOPS

An early view of Van Nest Shops shows tracks 1, 2, 3 and 4 in the large building for heavy repairs and tracks 5, 6, 7 and 8 in the Inspections Shed for running repairs. The small building to the left was employed for dipping of traction motor armatures. (Harry F. Brown – Bob's Photo collection)



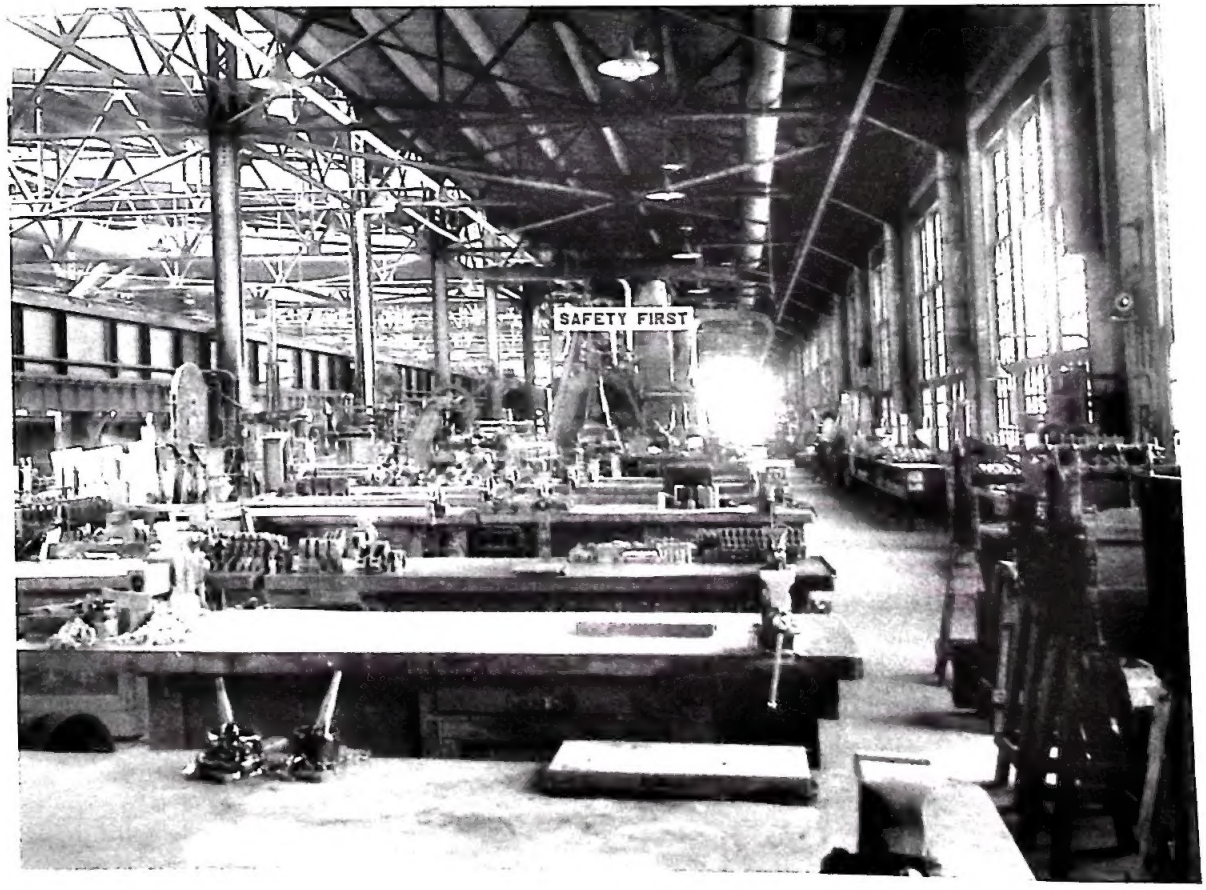
ABOVE: Inside Van Nest Shops were the inspections tracks with pits and overhead walkways. Motors #071 and 030 were undergoing inspection and light repairs during the early 1920s with other MU cars in the background. (Harry F. Brown – Bob's Photo collection)

BELOW: With a MU car under the overhead crane at the front end of the Erecting Bay, an EF-1 electric locomotive truck had been stripped from its carbody. Each powered axle had a twin Type 409 motor powered through the Quill drive to each set of 63-inch drivers. (Harry F. Brown – Bob's Photo collection)

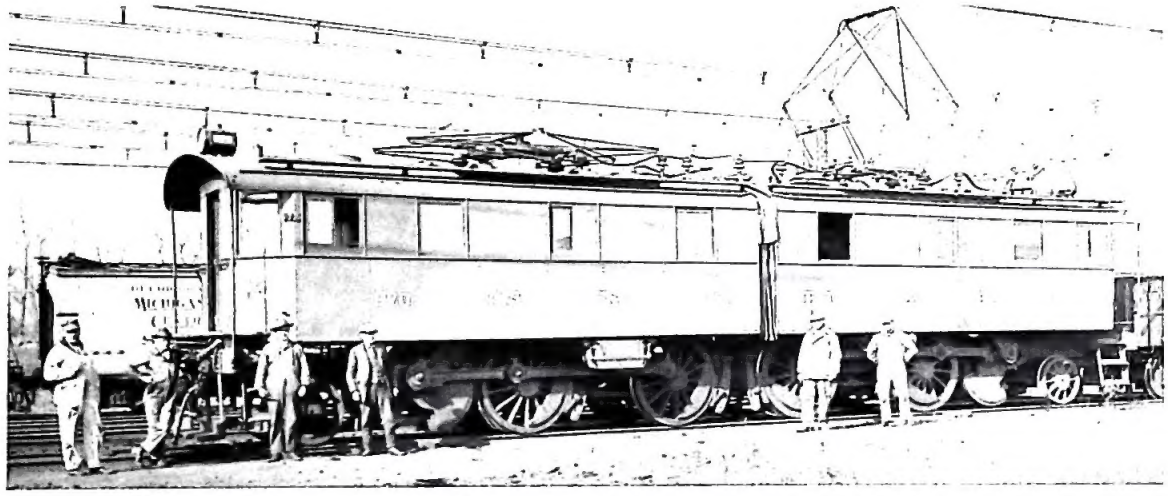


ABOVE: An interior view of Van Nest Shops showed the wheel and traction motor shop. At the far end, several armatures are on wooden stands, and in the foreground a wheel hub was being bored for proper fix on the axle. In the heavy bay, a class EY-2 underwent wreck repairs as well as several EP-1 locomotives in for overhaul. The crane runway supported a 20-ton Niles crane to move electric components and wheel sets. (Harry F. Brown – Bob's Photo collection)

BELOW: In the second floor electric shop, several work benches are lined up for the repair and overhaul of contactors and other related electrical equipment. Even in the 1920s, "safety first" was of primary concern for all the shop workers as specified on the large sign. (Harry F. Brown – Bob's Photo collection)



New Haven experimental electric locomotive #070 had a side-rod drive arrangement similar to the PRR's DD-1. Baldwin-Westinghouse built #070 in 1910. Photographed after the removal of third rail shoes and the steam boiler, #070 worked in local and work train service until 1935.



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